DEPARTMENT OF COMMUNITY DEVELOPMENT

ENGINEERING DIVISION

FY19 WATERLINE IMPROVEMENTS
BID AND CONTRACT DOCUMENTS

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Advertisement for Bids
Staunton, Virginia

Sealed bids for the furnishing of all labor, materials, supervision, and equipment necessary to complete the **FY 19 Waterline Improvements** will be received by the City of Staunton, Virginia, in the City Purchasing Agent's Office, Third Floor, City Hall, 116 W. Beverley Street until **2:00 p.m., September 27, 2018,** at which time they will be publicly opened and read aloud.

BIDS RECEIVED AFTER THE DATE AND TIME SPECIFIED WILL BE REJECTED. BIDS MUST BE SEALED, MARKED, AND DELIVERED TO:

Mail to:
City of Staunton
Chad Horvat
Finance Business Manager
P.O. Box 58
Staunton, VA 24402-0058
Phone: (540) 332-3819

Overnight To:
City of Staunton
Chad Horvat
Finance Business Manager
116 W. Beverley St., 3rd Floor
Staunton, VA 24401
Phone: (540) 332-3819

The work for which bids are to be submitted consists of approximately 2840 LF of 8"ductile iron water line, 1150 LF 6" ductile iron water line, 54 service connections, 905 LF of service line, 7 fire hydrants, associated appurtenances and street repairs, etc. A more complete description of the work and full information for contract bidders is given in the Specifications and Contract Documents.

A pre-bid meeting will be held **September 13, 2018 at 2:00 p.m.** in the City's Community Development Conference Room.

The envelopes containing the bids must be sealed, addressed to the City of Staunton, City Purchasing Agent's Office, Staunton, Virginia 24401, and marked as Bid for the **FY 19 Waterline Improvements.**

The Bid shall remain subject to acceptance for sixty (60) days.

The attention of bidders is invited to Title 2.2, Chapter 43 of the Code of Virginia. The procedure for withdrawal of bids shall conform to Procedure (A(i)), Section 2.2-4330 of the Code of Virginia.

The City of Staunton does not discriminate against small and minority businesses or faith based organizations.

City of Staunton

INFORMATION FOR BIDDERS

1. RECEIPT AND OPENING OF BIDS

The City of Staunton, Virginia, (hereinafter called the "OWNER", or "Public Body") invites bids on the form attached hereto, all blanks of which must be appropriately filled in. Bids will be received by the Owner in the City Purchasing Agent's office, Third Floor, City Hall, 116 W. Beverley Street, Staunton, Virginia until **2:00 p.m., September 27, 2018**.

BIDS RECEIVED AFTER THE DATE AND TIME SPECIFIED WILL BE REJECTED. BIDS MUST BE SEALED AND MARKED AS BID FOR:

FY 19 Waterline Improvements

BIDS MUST BE DELIVERED TO:

Mail to:
Chad Horvat
Finance Business Manager
P.O. Box 58
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Overnight To:
Chad Horvat
Finance Business Manager
116 W. Beverley St., 3rd Floor
Staunton, VA 24401
Phone: (540) 332-3819

The owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. Bid shall remain subject to acceptance for sixty (60) days.

2. PREPARATION OF BID

Each bid must be submitted on the prescribed form. All blank spaces for bid prices must be filled in, in ink or typewritten and the foregoing certification must be fully completed and executed when submitted.

Each bid must be submitted in a sealed envelope bearing on the outside the name of the bidder, his address, and the name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified in the bid form. BIDDER MUST WRITE ON OUTSIDE OF ENVELOPE: "REGISTERED CONTRACTOR, VIRGINIA CERTIFICATE NO."

3. SUBCONTRACTS

The bidder is specifically advised that any person, firm, or other party to whom it is proposed to award a subcontract under this contract must be acceptable to the Owner.

4. METHOD OF BIDDING

This is a **unit price bid** for:

FY 19 Waterline Improvements

(See Bid Schedule)

5. QUALIFICATIONS OF BIDDER

The Owner may make such investigations as he deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder indicates that the bidder is not properly qualified to carry out the obligations of the contract and to complete the work contemplated therein. Conditional bids will not be accepted.

6. BID SECURITY

Each bid must be accompanied by a bid bond in the amount of five percent (5%) of the bid submitted, or a certified check of the Bidder in an amount not less than five percent (5%) of the amount of the bid, payable to the order of the City of Staunton, Virginia. Such bid bonds or checks will be returned to all, except the three bidders submitting the most favorable bids, within three (3) days after the formal opening of the bids. The remaining bid bonds or checks will be returned to the three most favorable bidders within forty-eight (48) hours after the Owner and the accepted Bidder have executed the Contract, or if no contract has been so executed, within sixty (60) days after the date of the opening of the bids.

7. LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO CONTRACT

The successful bidder, upon his failure or refusal to execute and deliver the contract and bonds required within 10 days after he has received notice of the acceptance of his bid, shall forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited with his bid.

8. TIME AND COMPLETION AND LIQUIDATED DAMAGES

Bidder must agree to commence work on or before a date to be specified on a written "Notice to Proceed" from the OWNER and to **fully complete the work within 160 working days**. Working days refer to Monday through Fridays, excepting weekends and City of Staunton holidays.

OWNER and CONTRACTOR stipulate that delay by the CONTRACTOR in completion would have significant adverse consequences for the PROJECT; that, however, the actual damages to OWNER from such delay are uncertain and would be impossible and not susceptible to reasonable determination; and that liquidated damages of such failure by CONTRACTOR to perform in a timely manner are a reasonable way and not a penalty to address such adverse consequences. CONTRACTOR also stipulates that it shall not challenge, either directly or indirectly, this liquidated damages provision. OWNER, therefore, may require CONTRACTOR

to pay liquidated damages of $1,000 per day for the CONTRACTOR's failure to perform timely in strict accordance with the CONTRACT. OWNER may deduct any liquidated damages from amounts due to CONTRACTOR and, otherwise OWNER shall be entitled to receive interest at the rate of 5% until deducted or paid. Liquidated damages shall be, other than for delay, in addition to any other entitlement by OWNER to damages and other remedies for any other damage, loss, or injury for which CONTRACTOR may be responsible.

9. CONDITIONS OF WORK

Each bidder must inform himself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of this obligation to furnish all material and labor necessary to carry out the provisions of his contract. Insofar as possible, the contractor, in carrying out his work, must employ such methods or needs as will not cause any interruption of or interference with the work of any other contractor.

10. ADDENDA AND INTERPRETATIONS

No interpretation of the meaning of the plans, specifications or other pre-bid documents will be made to any bidder orally.

Every request for such interpretation should be in writing or emailed, addressed to Attention: Nickie D. Mills, City Engineer, 116 W. Beverley St., P.O. Box 58, Staunton, Virginia 24402, millsnd@ci.staunton.va.us, and to be given consideration, must be received by **12:00 P.M. on September 17, 2018.** Any and all such interpretations and any supplemental instructions will be posted on the City website not later than close of business day on **September 19, 2018**. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under this bid as submitted. All addenda so issued shall become part of the contract document.

11. SECURITY FOR FAITHFUL PERFORMANCE

Simultaneously with his delivery of the executed contract, the Contractor shall furnish a surety bond or bonds as security for faithful performance of this contract and for the payment of all persons performing labor on the project under the contract and furnishing materials in connection with this contract. Both payment bond and performance bond shall be in the amount of 100% of the contract price.

All bonds shall be on forms provided in the Contract Documents and written by companies LICENSED TO DO BUSINESS IN VIRGINIA and shall be administered through agent(s) registered in Virginia.

12. POWER OF ATTORNEY

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

13. NOTICE OF SPECIAL CONDITIONS

Attention is particularly called to those parts of the contract documents and specifications, which deal with the following:

a) Inspection and testing of materials
b) Insurance requirements

14. LAWS AND REGULATIONS

The bidder's attention is directed to the fact that all applicable State laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the contract will be deemed to be included in the contract as though herein written out in full.

15. METHOD OF AWARD - LOWEST QUALIFIED BIDDER

15.1 The contract will be awarded on the basis of the sum of the Base Bid and the accepted Alternates.

15.2 The award will be made to the lowest responsible bidder whose bid conforms to the invitation and whose qualifications indicate the award will be most advantageous to the City.

15.3 The City reserves the right to reject any or all offers and to waive informalities and minor irregularities in offers received.

15.4 The City will notify all bidders of the award and return bid sureties to all but the successful bidder.

15.5 After notice from the City, the successful bidder has ten (10) days to enter into a contract or forfeit as liquidated damages the security deposit. By executing the contract, the Contractor certifies that he has reviewed the Contract Documents and the project area and accepts the conditions of each.

15.6 Should the lowest bid for Base Bid exceed the City's budget, the City may proceed with negotiations with the lowest bidder for the Base Bid in accordance with section 2.2-4318 of the Code of Virginia to obtain a contract price within the funds available to the City. For the purpose of determining when such negotiations may take place, the term "available funds" shall mean those funds which were budgeted by the City for this contract (including all grant funding) prior to issuance of the written Invitation for Bids. Negotiations with the low bidder may include both modifications of the bid price and Scope of Work/Specifications to be performed. The City shall initiate such negotiations by written notice to the lowest responsive, responsible bidder that its bid exceeds the available funds and that the City wishes to negotiate a lower contract price. The times, places, and manner of negotiations shall be agreed to by the City and the lowest responsive bidder.

16. OBLIGATION TO BIDDER

At the time of the opening of bids, each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the plans and contract documents (including all addenda).

The failure or omission of any bidder to examine any form instrument or document shall in no way relieve any bidder from any obligation in respect of his bid.

Under Section 2.2-4330, Procedure (A(i)) of the Code of Virginia, a bidder for a contract with the State or any department, institution or agency thereof, or with any county, city, town, school board, or any agency thereof for the construction, demolition, alteration, repair or improvement may withdraw his bid from consideration if the price bid was substantially lower than the other bids due solely to a mistake therein, provided the bid was submitted in good faith, and the mistake was a clerical mistake as opposed to a judgment mistake, and was actually due to an unintentional arithmetic error or an unintentional omission of a quantity of work, labor, or material made directly in the compilation of a bid, evidenced by the inspection of original work papers, documents and materials used in the preparation of the bid sought to be withdrawn. The bidder must give notice in writing of his claim of right to withdraw his bid within two (2) business days after the conclusion of the bid opening procedure.

SCC Requirement: Pursuant to Code of Virginia, §2.2-4311.2 subsection B, a bidder or offeror organized or authorized to transact business in the Commonwealth pursuant to Title 13.1 or Title 50 is required to include in its bid or proposal the identification number issued to it by the State Corporation Commission (SCC). Any bidder or offeror that is not required to be authorized to transact business in the Commonwealth as a foreign business entity under Title 13.1 or Title 50 or as otherwise required by law is required to include in its bid or proposal a statement describing why the bidder or offeror is not required to be so authorized.

17. ADJUSTMENT OF CONTRACT

The Owner reserves the right to expand this contract to include work of the type defined in the project specifications, to other areas of the City. This expansion would be contingent upon the Contractor agreeing to perform the additional work at the same contract prices found in the proposal for the original contract.

The owner reserves the right to make, at any time during the progress of the work, such increases or decreases in quantities as deemed in the best interest of the Owner. Adjustments of contract unit prices will not be considered for overruns or underruns of the original bid quantities. Unit price adjustments will not be made in the event of the elimination of any other associated bid item.

18. PRE-BID MEETING

A pre-bid meeting will be held at **2:00 p.m., September 13, 2018**, in the City's Community Development Conference Room.

BID

FY19 Waterline Improvements

TO: City of Staunton
City Hall
P.O. Box 58
Staunton, Virginia 24402

Gentlemen:

The undersigned, as Bidder, does hereby declare that the only person, persons, company or parties interested in this Bid are named herein; that this Bid is made and that the Contract will be executed without collusion with any other person or persons presenting any Bid for the same work, labor and materials; that this Bid is in all respects fair and just and that no person prohibited therefrom by law is directly or indirectly interested in this Bid, nor in the labor and materials to which it relates, nor in any portion of the profits thereof.

The undersigned does further declare that he has personally examined the site of the proposed work and made such investigation as is necessary to determine the general and local conditions and the character of the work to be encountered; that he has carefully examined each and every item of the annexed Contract Documents and the Plans and Specifications pertaining hereto, and that he fully understands the same, and will make no claim, other than as stated therein, because of any misunderstanding or misconception concerning the nature, charter or amount of work to be done.

The undersigned does hereby offer and agree to execute and perform the Contract attached hereto, and of which this Bid forms a part; and to furnish all of the labor, materials, tools, equipment, transportation and superintendence for the construction; in strict conformity with the drawings and specifications. The undersigned further proposes to perform the work at the prices set opposite each item, it being understood that the quantities given are estimates only and payment will be made on the basis of actual quantities as developed during the construction.

BID SCHEDULE

FY19 Waterline Improvements

BID	ITEM	UNITS	ESTIMATED	UNIT	TOTAL
1	Mobilization	LS	1.00		
2	8" DI Water Line	LF	2840.00		
3	6" DI Water Line	LF	1150		
4	3/4" Service Line	LF	905		
5	1" Copper Service Line	LF	30.00		
6	2" Galvanized Water Line	LF	15.00		
7	8" X 8" Tapping Sleeve and Valve	EA	2.00		
8	8" Gate Valve and Box	EA	3.00		
9	6" Gate Valve and Box	EA	11.00		
10	8" X 6" Tee	EA	6.00		
11	6" x 6" Tee	EA	3.00		
12	6" Fire Hydrant Assembly	EA	7.00		
13	Bends, Plugs, Reducers	LBS	485		
14	Type I Service Connection	EA	53.00		
15	Type II Service Connection	EA	1.00		
16	Type III Service Connection	EA	1.00		
17	Abandon Existing Water Line	EA	2.00		
18	Connect to Existing Water Line	EA	3		
19	Solid Rock Excavation	CY	300.00		
20	Traffic Control	LS	1.00		
21	Site Clearing	LS	1.00		
22	Erosion and Sediment Control Measures	LS	1.00		
23	2" Blow Off Assembly	EA	1.00		
24	2" Temp Blow Off Assembly	EA	1.00		
25	Flowable Backfill	LF	150.00		
26	Abandon Existing Hydrant	EA	5.00		
27	1" Air Relief Valve Assembly	EA	2.00		

TOTAL BASE BID _____

WORDS

_____

FIGURES

OPTIONAL BID ITEM:

	Full Stone Backfill	LF	2500		

AMOUNTS ARE TO BE SHOWN IN BOTH WORDS AND FIGURES. IN CASE OF DISCREPANCY, THE AMOUNT SHOWN IN WORDS WILL GOVERN.

The undersigned agrees to complete the work enumerated herein **in accordance with Paragraph 8 of Information for Bidders.** It is expressly understood and agreed that the time of beginning, rate of progress, and the date of completion are essential conditions, and that in the event of failure to complete the work within the above specified time, the Contractor will be liable for the payment of liquidated damages as provided in **Paragraph 8 of Information for Bidders**. Extensions may be granted, upon written request, for inclement weather and for any other cause not the fault of the Contractor. The City reserves the right to shut the project down for extended periods due to inclement weather. Deadline extensions will be made to equally compensate for periods of shut down.

The undersigned likewise agrees that he will execute and deliver the Contract hereto attached within ten (10) days, Sundays and City of Staunton holidays excepted, after notification of the acceptance of this Bid and award of the Contract; and will furnish a performance and a payment bond for the total amount of the accepted Bid on the forms provided in the Contract Documents, satisfactory to the Owner as surety for the faithful performance and completion of the Contract and the payment of all subcontractors, material dealers and labor.

The undersigned certifies that he understands that it is the intent of the drawings, and the Contract Documents, that the work be completed in every respect and that no additional compensation will be allowed for minor tasks necessary to completely perform the work.

The undersigned acknowledges Addenda:

Addenda No. _____ Addenda _____
Addenda No. _____ Addenda _____

The undersigned has checked carefully all the above figures and understands that the Owner will not be responsible for any errors or omissions in making up this Bid.

_____ By: _____
Contractor

Printed Name: _____

Title: _____

_____ Address: _____
Registered Virginia Contract Number

_____
_____
SCC Number _____

_____ Telephone: _____
Contractor's IRS Number

Dates this ____ day of _____ 20____

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned

_____as Principal, and

_____as Surety, are hereby held and firmly bound unto _____as Owner in the penal sum of _____ for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

Signed, this _____day of _____, 20___

The condition of the above obligation is such that whereas the Principal has submitted to _____ a certain bid attached hereto and hereby made a part of hereof to enter into a contract in writing, for the_____

_____

_____

NOW THEREFORE,

(a) If said Bid shall be rejected, or in the alternate

(b) If said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said Bid) and shall furnish a bond for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said Bid.

Then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The surety for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by an extension of the time within which the Owner may accept such Bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____ (L.S.)
Principal

_____
Surety

By: _____

Seal

CONTRACT

THIS AGREEMENT, dated this ____ day of _____, 20__, for identification, is made by and between the CITY OF STAUNTON, VIRGINIA (the "OWNER"), a municipal corporation of the Commonwealth of Virginia acting by and through its City Manager, and

_____ (The "CONTRACTOR"), a _____
(Name of CONTRACTOR) (State)

Corporation licensed and registered to do business in the Commonwealth of Virginia.

WITNESSETH: That for and in consideration of the payments and agreement hereinafter mentioned, to be made and performed by the OWNER, the CONTRACTOR hereby agrees with the OWNER to commence and complete the construction described as follows:

FY 19 WATERLINE IMPROVEMENTS

Hereinafter called the PROJECT, for a sum not to exceed_____
_____ under the terms of the contract documents

For said price, the CONTRACTOR is to furnish all materials, labor, superintendence, equipment, tools, machinery, and other accessories and services necessary to complete the said PROJECT.

The Contract Documents, which comprise the entire AGREEMENT between OWNER and CONTRACTOR, consist of the following:

1. **This Agreement**
2. **Information for Bidders**
3. **Bid and Addenda**
4. **Performance and Payment Bonds**
5. **General Conditions**
6. **Special & Supplementary Conditions**
7. **Technical Specifications**
8. **Standard Drawings**
9. **Plan Sheets**

Said documents are those prepared by the City Engineering Department or its assigned representative for the specific PROJECT.

The OWNER agrees to make payment to the CONTRACTOR in accordance with the General Conditions and for the price specified in the bid for work completed as stated above as the sum to be paid.

OWNER and CONTRACTOR stipulate that delay by the CONTRACTOR in completion would have significant adverse consequences for the PROJECT; that, however, the actual damages to OWNER from such delay are uncertain and would be impossible and not susceptible to reasonable determination; and that liquidated damages of such failure by CONTRACTOR to perform in a timely manner are a reasonable way and not a penalty to address such adverse consequences. CONTRACTOR also stipulates that it shall not challenge, either directly or indirectly, this liquidated damages provision. OWNER, therefore, may require CONTRACTOR to pay liquidated damages of $1,000 per day for the CONTRACTOR's failure to perform timely in strict accordance with the CONTRACT.

OWNER may deduct any liquidated damages from amounts due to CONTRACTOR and, otherwise OWNER shall be entitled to receive interest at the rate of 5% until deducted or paid. Liquidated damages shall be, other than for delay, in addition to any other entitlement by OWNER to damages and other remedies for any other damage, loss, or injury for which CONTRACTOR may be responsible.

The OWNER agrees to pay the CONTRACTOR in current funds for the performance of the contract, subject to additions and deductions as provided in the Proposal and to make payments on account thereof as provided in the Supplement General Conditions.

IN WITNESS WHEREOF, the parties to these presents have executed this contract in four (4) counterparts, each of which shall be deemed an original, in the year and day first above mentioned.

	(Seal)
City Engineer's Initials	City Manager or Authorized Representative
Director of Finance Initials	

Approved as to Legality and Form:

	(Seal)
City Attorney	Contractor
	By:
Secretary	
	Title
Witness	
	Address

Note: Secretary of the OWNER should attest. If CONTRACTOR is a corporation, Secretary should attest.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: that _____
_____
_____
(Insert full name or legal title and address of Contractor)

as Principal, hereinafter called Contractor,

and _____
_____
(Insert full name or legal title and address of Surety)

as Surety, hereinafter called Surety, are held and firmly bound unto _____
_____
_____
(Insert Name and Address of Owner)

as Obligee in the amount of: _____dollars ($_____)
(Insert sum equal to contract price in both words and figures)

for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

Contractor has by written agreement dated _____, 20____
entered into a Contract with Owner for:

FY19 Waterline Improvements
Staunton, Virginia

in accordance with Drawings and Specifications as prepared by or for:

City of Staunton Engineering Department
116 West Beverley Street
Staunton, Virginia 24401

which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Contractor shall promptly and faithfully perform said Contract, in strict conformity with the Drawings, Specifications and Contract Documents, then this obligation shall be null and void. Otherwise, it shall remain in full force and effect for one (1) year after completion of all work:

a. The Surety hereby waives notice of any alternation or extension of time made by the Owner.

b. Any suit under this bond must be instituted, (1) before the expiration of one (1) year after completion of the Contract including the expiration of all warranties and guarantees, or (2) before the expiration of one (1) year after a defect or breach of warranty is discovered, if the action be for such.

c. No right of action shall accrue on this bond to or for the use of any person or corporation other than the Owner named herein or the successors or assigns of Owner and every action brought hereon shall be filed and maintained solely in the General District Court or the Circuit Court of the City of Staunton, Virginia.

SIGNED AND SEALED THIS _____ day of _____, 20___

In the presence of:

_____(SEAL)
PRINCIPAL

_____
WITNESS

_____
BY TITLE

_____
SURETY

_____
WITNESS

_____
BY TITLE

Surety: (Attach power of attorney)

CONTRACTOR'S PERFORMANCE BOND
Project: _____

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS:

that _____

_____

_____

(Insert full name or legal title and address of Contractor)

as Principal, hereinafter called Contractor,

and _____

_____

_____

(Insert full name or legal title and address of Surety)

as Surety, hereinafter called Surety, are held and firmly bound unto

_____

_____

(Insert full name or legal title and address of Owner)

as Obligee for the use and benefit of claimants as herein below defined in the amount of: _____

_____ ($_____).

(Insert sum equal to contract price in both words and figures)

for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

Contractor has by written agreement dated _____, 20___, entered into a Contract with Owner for:

_____

City of Staunton

(Insert name or description and location of project)

in accordance with Drawings and Specifications as prepared for: City of Staunton Engineering Department, 116 West Beverley Street, Staunton, Virginia 24401

_____

_____

(Insert full name or legal title and address)

which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Contractor shall promptly make payment to all claimants as hereinafter defined, for all labor and materials used or reasonably required for use in the performance of the Contract, then this obligation shall be void. Otherwise it shall remain in full force and effect, subject, however, to the following conditions:

a. A Claimant is defined as one having a direct contract with the Contractor for labor, material, or both, used or reasonably required for use in the performance of the Contract, labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental of equipment directly applicable to the Contract.

b. The above named Contractor and Surety hereby jointly and severally agree with the Owner that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work of labor was done or performed, or materials were furnished by such claimant, may sue on this bond, prosecute the suit to final judgment for such sum or sums as many be justly due claimant and have execution thereon. The Owner shall not be liable for the payment of any costs or expenses of any such suit.

c. Any suit or action hereunder by any claimant:

1. Shall not be commenced after the expiration of one (1) year following the date on which the claimant last performed labor or last supplied materials.

2. Shall be filed and maintained solely in the General District Court or the Circuit Court of the City of Staunton, Virginia.

SIGNED AND SEALED THIS _____ day of _____, 20___, in the presence of:

_____(SEAL)
PRINCIPAL

_____ _____
WITNESS BY TITLE

_____(SEAL)
SURETY

_____ _____
WITNESS BY TITLE

Surety:
(Attach power of attorney)

CONTRACTOR'S LABOR AND MATERIAL PAYMENT BOND
Project_____

GENERAL CONDITIONS
CITY OF STAUNTON, VIRGINIA

Article 1: Intent

1.1 The Contract Documents comprise the entire agreement between the City and Contractor concerning the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the law of the place of the Project.

1.2 It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any Work, materials or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be furnished and performed whether or not specifically called for. When words or phrases which have a well-known technical or construction industry or trade meaning are used to describe Work, materials or equipment, such words or phrases shall be interpreted in accordance with that meaning.

1.3 Plans and Specifications – All Work that may be called for in the Specifications and not shown on the Plans, or shown on the Plans and not called for in the Specifications, shall be executed and furnished by the Contractor as if described in both these ways; and should any work or materials be required which are not detailed in the Specifications or Plans, either directly or indirectly, but which are nevertheless necessary for the proper carrying out of the intent thereof, the Contractor is to understand the same to be implied and required, and shall perform all such work and furnish any such materials as fully as if they were particularly delineated and described. The Contractor shall keep one copy of all Plans and Specifications on the project at all times.

1.4 This procurement is being conducted on behalf of other public bodies, in accordance with § 2.2-4304 (A) of the Code of Virginia. If authorized by the bidder, the resultant contract may be extended to any public body in the Commonwealth of Virginia in accordance with contract terms.

Article 2: Insurance

2.1 The Contractor shall not commence Work under this contract until he has obtained all the insurance required under this paragraph and such insurance has been approved by the City, nor shall the Contractor allow any Subcontractor to commence Work on his subcontract until the insurance required of the Subcontractor has been so obtained and approved.

a) The Contractor shall procure and maintain during the life of this contract Worker's Compensation Insurance as required by applicable Virginia law for all of his employees to be engaged in Work at the site of the Project under this contract and, in case of any such Work sublet, the Contractor shall require the Subcontractor similarly to provide Worker's Compensation Insurance for all of the latter's employees to be engaged in such Work unless such employees are covered by the protection afforded by the Contractor's Worker's Compensation Insurance. In case any class of employees engaged in hazardous work on the project under this contract is not protected under the Worker's Compensation Statute, the Contractor shall provide and shall cause each Subcontractor to provide adequate employer's Liability Insurance for the protection of such of his employees as are not otherwise protected.

b) Contractor's General Liability and Vehicle Liability Insurance: The Contractor shall procure and shall maintain during the life of the contract Contractor's General Liability Insurance and Vehicle Liability Insurance in the amounts specified in Section 2.3 below.

c) Subcontractor's General Liability and Vehicle Liability Insurance: The Contractor shall either (1) require each of his Subcontractors to procure and to maintain during the life of his subcontract, Subcontractor's General Liability and Vehicle Liability Insurance of the type and in the amounts specified in subparagraph (b) hereof or (2) insure the activities in his policy, specified in subparagraph (b) hereof.

d) Fire, Extended Coverage, Vandalism, and Malicious Mischief (Completed Value Builder's Risk) Insurance: The Contractor shall purchase "All Risk" type Builder's Risk Insurance. The policy shall cover not less than the losses due to fire, explosion, hail, lightning, vandalism, malicious mischief, wind, water, flood, collapse, riot, aircraft, and smoke during the contract time, and until the work is accepted by the Owner. The Builder's Risk Insurance shall be for the benefit of the Owner, the Contractor, and the Subcontractors, as their interest may appear.

e) Scope of Insurance and Special Hazards: The insurance required under subparagraphs (b) and (c) hereof shall provide adequate protection for the Contractor and his Subcontractors, respectively, against damage claims which may arise from operations under this contract, whether such operations be by the insured or by anyone directly or indirectly employed by him and, also against any of the special hazards which may be encountered in the performance of this contract.

f) Proof of Carriage of Insurance: The Contractor shall furnish the City with certificates showing the type, amount, class of operations covered, effective dates, and date of expiration of policies.

2.2 Special Hazards – The Contractor's and his Subcontractor's Public Liability and Property Damage Insurance shall provide adequate protection against the following special hazards:

1) OWNER'S PROTECTIVE LIABILITY INSURANCE
2) CONTRACTOR'S COMPLETED OPERATIONS

All insurance coverages shall be written by companies licensed to do business in Virginia and shall be administered by a Virginia registered agent and shall list the City as an additional insured.

2.3 GENERAL LIABILITY, VEHICLE LIABILITY, AND WORKER'S COMPENSATION INSURANCE: The Contractor's General Liability Insurance, Vehicle Liability Insurance, and Worker's Compensation Insurance shall not be less than $2,000,000, $500,000, and $500,000 respectively. BUILDERS RISK shall not be less than the contract amount.

The Contractor shall either (1) require each of his Subcontractors to procure and to maintain during the life of his subcontract, Subcontractor's General Liability and Vehicle Liability Insurance of the type and in the same amounts as specified in the preceding paragraph, or (2) insure the activities of his Subcontractors in his own policy.

Article 3: Availability of Lands

3.1 City shall furnish, as indicated in the Contract Documents, the lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for the use of Contractor. Upon reasonable written request, City shall furnish Contractor with a correct statement of record legal title and legal description of the lands upon which the Work is to be performed and City's interest therein as necessary for giving notice of or filing a mechanic's lien against such lands in accordance with applicable Laws and Regulations. City shall identify any encumbrances or restrictions not of general application but specifically related to use of lands so furnished with which Contractor will have to comply in performing the Work. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by City, unless otherwise provided in the Contract Documents. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

3.2 CONSTRUCTION IN PUBLIC RIGHTS-OF-WAY - The Contractor shall perform all his operations in a manner that will cause the minimal possible disruption to the normal vehicular and pedestrian traffic. The Contractor shall not block streets or highway to traffic without the prior consent of the City. Flagmen, lights, barricades, and construction signs shall be provided as directed by City. All barricades, signs, cones, etc. must conform to the guidelines established by the Manual of Uniform Traffic Control Devices (M.U.T.C.D.) and the Virginia Work Area Protection Manual. All flagmen must be Virginia Department of Transportation certified. Pavement, shoulders, ditches, drainage structures and all other facilities disturbed during the construction shall be restored to their original condition, at the Contractor's expense except for work specifically itemized

in the proposal. The Performance Bond shall cover all work on the City's rights-of-way and easements and the Contractor shall be responsible for the repair and maintenance of all areas disturbed within said rights-of-way and easements. No open ditches shall be permitted over night in public rights-of-way.

3.3 CONSTRUCTION ON PRIVATE AND PUBLIC PROPERTY - The area of the construction shall be left in the same condition as it was found. All private and public utilities pipes, wires, lines, fences, walls, walks, pavements, curb and gutter, graveled areas, driveways, drainage structures, trees, shrubs, mailboxes, guy wires, septic systems, etc., encountered during the work whether shown on the Plans or not, shall be protected from damage by the Contractor. Should any facilities be damaged, the Contractor shall repair, replace, or pay damages for same. The surface of the construction area shall be graded, stoned, paved, seeded, etc.; to fit original conditions encountered. Payment for this work shall be included in the Proposal price of the item under construction.

Article 4: Existing Utilities

4.1 The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the site is based on information and data furnished to the City or by the owners of such Underground Facilities or by others, unless otherwise expressly provided in the Supplementary Conditions.

4.2 City shall not be responsible for the accuracy or completeness of any such information or data; and

4.3 The cost of all of the following will be included in the Contract Price and Contractor shall have full responsibility for: (i) reviewing and checking all such information and data, (ii) locating all Underground Utilities shown or indicated in the Contract Documents, (iii) coordination of the Work with the owners of such Underground Facilities during construction, and (iv) the safety and protection of all Underground Facilities and repairing any damage thereto resulting from the Work.

4.4 EXISTING UTILITY LINES - The Contractor shall not disturb or damage any existing utility lines found above or below ground whether shown on the Plans or not. If during the course of the work any disturbance, or breakage should occur, the Contractor shall replace, at his own expense, the affected utility lines to the satisfaction of the City and the proper utility company. The Contractor shall bear full responsibility for any damage to life and/or property incurred as a result of such disturbance or damage to existing utility lines. Special attention should be paid to the Code of Virginia, Sections 59.1-406 - 59.1-414 - "Overhead High Voltage Line Safety Act".

Article 5: Schedule

5.1 SCHEDULE OF CONSTRUCTION – Commencement of construction shall begin by the date determined by the City. Prior to initiation of construction, the Contractor shall have submitted a detailed work schedule to the City and have received approval of same. The Contractor must proceed according to the approved schedule unless the changes are approved by the City.

5.2 Contractor shall submit to City for acceptance proposed adjustments in the progress schedule that will not change the Contract Times. Such adjustments will conform generally to the progress schedule.

Article 6: Shop Drawing, Material Data Sheets

6.1 Contractor shall submit Shop Drawings to City for review and approval. All submittals will be identified as City may require and in the number of copies specified. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to show City the materials and equipment Contractor proposes to provide and to enable City to review the information.

6.2 Contractor shall also submit material Data Sheets to City for review and approval. Each submittal will be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which intended and otherwise as City may require to enable City to review the submittal.

6.3 Before submitting each Shop Drawing or Material Data Sheet, Contractor shall have determined and verified:

6.3.1 all field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar information with respect thereto,

6.3.2 all materials with respect to intended use, fabrication, shipping, handling, storage, assembly and installation pertaining to the performance of the Work, and

6.3.3 all information relative to Contractor's sole responsibilities in respect of means, methods, techniques, sequences and procedures of construction and safety precautions and programs incident thereto.

6.4 Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier,

the specification or description is intended to establish the type, function and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be accepted by City under the following circumstances:

6.5 "Or-Equal": If in City's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by City as an "or-equal" item, in which case review and approval of the proposed item may, in City's sole discretion, be accomplished without compliance with some or all of the requirements for acceptance of proposed substitute items.

6.6 *Substitute Items:* If in City's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" it will be considered a proposed substitute item. Contractor shall submit sufficient information as provided below to allow City to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. If Contractor wishes to furnish or use a substitute item of material or equipment, Contractor shall first make written application to City for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified and be suited to the same use as that specified. The application will state the extent, if any, to which the evaluation and acceptance of the proposed substitute will prejudice Contractor's achievement of Substantial Completion on time, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contact Documents to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other Contractors affected by the resulting change, all of which will be considered by City in evaluating the proposed substitute. City may require Contractor to furnish additional data about the proposed substitute.

Article 7: Contractor's Responsibilities

7.1 It is understood and agreed that the Contractor has, by careful examination, satisfied himself as to the nature and locations of the work, the conformation of the ground to be encountered, the character of equipment and facilities needed preliminary to and during the prosecution of the work, the general and local conditions and all other matters which in any way effect the work under this Contract. No verbal agreement or conversation

with any officer, agent or employee of the City either before or after the execution of this Contract, shall affect or modify any of the terms or obligations herein contained.

7.2 The Contractor shall keep on the work during its progress, a competent superintendent, satisfactory to the City and any directions given to such superintendent shall be as binding as if given to the Contractor. If the Contractor, in the course of the work, finds any discrepancy between the drawings and the physical conditions of the locality or any errors or omissions in drawings or in the layout as given by Points and Instructions, it shall be his duty to immediately inform the City in writing, and the City shall promptly verify the same. Any work done after such discovery, until authorized, will be done at the Contractor's risk.

7.3 Contractor shall supervise, inspect and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences and procedures of construction. Contractor shall be responsible to see that the completed Work complies accurately with the Contract Documents.

7.4 Unless otherwise specified in the Contract Documents, Contractor shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and completion of the Work.

7.5 All materials and equipment shall be good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Specifications shall expressly run to the benefit of the City. If required Contractor shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with instructions of the applicable Supplier, except as otherwise provided in the Contract Documents.

7.6 Throughout the course of the construction, the Contractor shall maintain the project free from any conditions, which may result in danger or nuisance to the public, including but not limited to dust and street disrepair.

7.7 The Contractor shall be responsible for the condition of all excavations made by him. All slides and cave-ins shall be removed without extra compensation, at whatever time and under whatever circumstances they may occur.
The neglect, failure, or refusal of the City to order the use of bracing or sheeting, or a better quality, grade, or section, or larger sizes of steel or timber, or to order sheeting, bracing, struts, or shoring to be left in place, or the giving or failing to give orders or

directions as to the manner or methods of placing or driving sheeting, bracing, jacks, wales, rangers, etc., shall not in any way or to any extent relieve the Contractor of any responsibility concerning the condition of excavation or any of his obligations under the Contract; nor shall any delay, whether caused by any action or want of action on the part of the Contractor, or any acts of the City, or his agents, or employees, resulting in the keeping of an excavation open longer than would otherwise have been necessary, relieve the Contractor from the necessity of properly and adequately protecting the excavation from caving or slipping, nor from any of his obligations under the Contract relating to injury of persons or property, nor entitle him to any claim for extra compensation. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN PROPER AND SUFFICIENT SHEETING, SHORING AND BRACING TO PROTECT ALL PERSONS CONNECTED WITH THE WORK FROM INJURY.

7.8 Adequate sanitary conveniences for the use of persons employed on the work, properly secluded from public observation, shall be constructed and maintained by the Contractor in such a manner and at such points as shall be approved by the City. These conveniences shall be maintained at all times without nuisance and their use shall be strictly enforced; upon completion of the work they shall be removed leaving the area clean and free from nuisance.

7.9 The Contractor will be required to comply with the City's Erosion and Sediment Control Ordinance. Special care shall be taken to prevent siltation of existing sewer, streets, drainage ditches, and private property.

7.10 Contractor shall obtain and pay for all construction permits and licenses. City shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work, which are applicable at the time of opening Bids, or, if there are no Bids, on the Effective Date of the Agreement.

7.11 The Contractor shall provide all field engineering services necessary for laying out the Project. All such services shall be performed by a Professional Surveyor registered with the State of Virginia. Control points shall be established and maintained during the execution of the Project. All documentation and control points shall be made available to the City throughout the execution of the Project.

7.12 The Contractor shall provide at their cost an independent testing service, approved by the City, to perform all testing required by the Contract Documents. Written reports shall be provided to the City.

7.13 The Contractor shall provide “as built” plans within 30 days of project completion. Such plans shall be prepared by a Licensed Surveyor and shall show such items as final elevations, grades, structure locations, etc.

7.14 Representatives of the City, as well as representatives of Local, State and Federal agencies and parties having an interest in the project shall have access to the work wherever it is in preparation or progress and the Contractor shall provide proper facilities for such access and review.

7.15 During the performance of this contract, the Contractor agrees to (i) provide a drug-free workplace for the Contractor's employees; (ii) post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violations and such prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of the Contractor that the Contractor maintains a drug free workplace; and (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of over $10,000.00, so that such provisions will be binding upon each Subcontractor or vendor.

7.16 Contractor certifies that it does not and will not during the performance of this Contract violate (i) the provisions of the Federal Immigration Reform and Control Act of 1986, as amended and §40.1-11.1, Code of Virginia, which prohibits the employment of illegal aliens and (ii) the provisions of Federal and State employment and wage hour laws. The Contractor shall include and enforce the language in the last sentence in every subcontract issued under this Contract and shall require the subcontractor to do the same.

Article 8: Subcontracts

8.1 Contractor shall not employ any Subcontractor, Supplier or other person or organization whether initially or as a substitute, against whom City may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier or other person or organization to furnish or perform any of the Work against whom Contractor has reasonable objection.

8.2 Contractor shall be fully responsible to City for all acts and omissions of the Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with Contractor just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents shall create for the benefit of any such Subcontractor, Supplier or other person or organization any contractual relationship between City and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of the City to pay or to see the payment of any moneys due any such Subcontractor, Supplier or other person or organization except as may otherwise be required by Laws and Regulations.

8.3 Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with Contractor. Contractor shall require all Subcontractors, Suppliers and such other persons and organizations performing or furnishing any of the Work to communicate with the City through Contractor.

8.4 The Contractor shall, as directed by the Owner, remove from all public and private property, at his own expense, all temporary structures, rubbish and waste materials, resulting from his operations; and shall leave the site in a neat, orderly condition.

Article 9: Owner's Responsibility

9.1 The Owner through his designated representatives shall have general supervision and direction of the work. He has the authority to stop the work whenever such stoppage may be necessary to ensure the proper execution of the Contract. He shall also have authority to reject all work and materials which do not conform to the Contract, to direct the application of forces to any portion of the work as in his judgment is required, to order the force increased or diminished and to decide questions which arise in the execution of the work.

9.2 Wherever work being done by the City's forces or by other Contractors is contiguous to work covered by this Contract the respective rights of the various interests involved shall be established by the City to secure the completion of the various portions of the work in general harmony.

9.3 If the Contractor should neglect to execute the work properly or fail to perform any provision of this Contract, the City after three days written notice to the Contractor, may without prejudice to any other remedy make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor.

9.4 City shall promptly furnish the data required under the Contract Documents and shall make payments to Contractor promptly when they are due.

9.5 City shall provide inspection of the Contractors Work.

9.6 The City shall have the right at any time, for reasons which appear good to them, to annul this Contract upon giving written notice to the Contractor, in which event the Contractor shall be entitled to the full amount of the estimate for the work done by him under this Contract up to the time of such annulment, including the retained percentage. The Contractor shall be reimbursed by the City for such expenditures that are not otherwise compensated for, and as are required in preparing for and moving to and from the work; the intent being that an equitable settlement shall be made with the Contractor.

Article 10: Changes in Work

10.1 Without invalidating the Agreement and without notice to any surety, City may, at any time or from time to time, order additions, deletions or revisions in the work. Any additions, deletions or revisions will be authorized by a Change Order. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents.

10.2 Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any Work performed that is not required by the Contract Documents as amended, modified and supplemented.

10.3 City and Contractor shall execute appropriate Change Orders covering:

10.3.1 changes in the Work which are ordered by City;

10.3.2 changes in the Contract Price or Contract Times which are agreed to by the parties; and

10.3.3 Changes in the Contract Price or Contract Times, which embody the substance of any written decision, rendered by City.

Article 11: Changes in Contract Price

11.1 The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to Contractor for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by Contractor shall be at Contractor's expense without change in Contract Price.

11.2 The Contract Price may only be changed by a Change Order. Any claim for an adjustment in the Contract Price shall be based on written notice delivered by the party making the claim to the other party and to City promptly after the start of the occurrence or event giving rise to the claim and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within 20 days after the start of such occurrence or event and shall be accompanied by claimant's written statement that the adjustment claimed covers all known amounts to which the claimant is entitled as a result of said occurrence or event. No claim for an adjustment in the Contract Price will be valid if not submitted in accordance with this paragraph 11.2.

11.3 The value of any Work covered by a Change Order or of any claim for an adjustment in the Contract Price will be determined as follows:

11.3.1 Where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved.

11.3.2 Where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum.

Article 12: Changes in Contract Times

12.1 The Contract Times may only be changed by a Change Order except for inclimate weather days as determined by the City. Such inclimate weather days shall be maintained by the City and added to the number of days permitted for completion of the Project. Any claim for an adjustment of the Contract Times shall be based on written notice delivered by the party making the claim to the other party and to City promptly after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within 20 days after such occurrence and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Times shall be determined by City. No claim for an adjustment in the Contract Times will be valid if not submitted in accordance with the requirements of this paragraph 12.1.

12.2 Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a claim is made therefor as provided in paragraph 12.1. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by City, acts or neglect of utility owners, fires, floods, epidemics, abnormal weather conditions or acts of God. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within control of Contractor.

12.3 Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of both City and Contractor, an extension of the Contract Times in an amount equal to the time lost due to such delay shall be Contractor's sole and exclusive remedy for such delay. In no event shall City be liable to Contractor, any Subcontractor, any Supplier, any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from (I) delays caused by or within the control of Contractor, or (ii) delays beyond the control of both parties including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God or acts or neglect by utility owners.

Article 13: Indemnification

13.1 The Contractor agrees to indemnify, defend and hold harmless the City, its members of Council, officers, directors, agent and employees, against any and all claims, liabilities, losses, damages, costs and expenses (including reasonable attorney fees) arising out of, or resulting from any and all injuries to persons or damage to property arising out of services performed hereunder or by reason of the intentional or negligence acts or omissions of the Contractor, its employees, agents or sub-consultants, including any independent contractors.

Article 14: SEPARATE CONTRACTS

14.1 The City reserves the right to let other contracts in connection with this work. The Contractor shall afford other Contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs.

Article 15: Payment

15.1 5% of the dollar amount of the estimate of work completed shall be withheld until the final acceptance of the project. Payment shall be made based on estimates of work completed in the preceding month submitted on, or before the 5th day of the month for the duration of the contract. Application for partial payments shall be submitted on Standard City form.

15.2 Material stored on site shall be paid for based on supplier invoice only.

15.3 Failure by the City to make payments at the time provided by this Contract shall give the Contractor the right to suspend work until payment is made, or, at his option, after thirty days written notice, should the City continue to default; to terminate this Contract and recover the price of all work done and materials provided and all damages sustained; and such failure to make payment at the time provided shall be a bar to any claim by the City against the Contractor for delay in completion of the work, due to such suspension or failure to pay.

15.4 Payments to Subcontractors: The Contractor shall take one of two actions within seven days after receipt of payment by the City.

a) Pay the Subcontractor for the proportionate share of the total payment received from the City attributable to the work performed by the Subcontractor under that contract; or

b) Notify the City and Subcontractor, in writing, of his intention to withhold all or a part of the Subcontractor's payment with the reason for nonpayment.

The Contractor shall pay interest to any Subcontractor on all amounts owed by the Contractor that remain unpaid after seven days following receipt by the Contractor of payment by the City for work performed by the Subcontractor. Interest shall accrue at the rate of 1 percent per month.

15.5 Upon the completion of the work and its final acceptance by the City, the Contractor shall submit his final estimate over his signature, covering work provided for in this Contract, completed and accepted by the City under the terms and condition hereof, whereupon the balance found to be due the Contractor, including the retained percentage, shall be paid to the Contractor within 30 days of receipt of the final estimate by the City, provided that, before the payment of said final estimate the Contractor shall submit evidence satisfactory to the City that all payrolls, material bills and outstanding indebtedness in connection with the work have been paid and that the Maintenance Bond has been posted. The payment of the final estimate due under this Contract and any and all alterations of same, shall release the City and the officers and agents thereof, from any and all claims or liabilities on account of the work performed and materials furnished under this Contract or any alterations thereof.

Article 16: Discrimination

16.1 During the performance of this contract, the Contractor agrees as follows:

(a) The Contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin, age, disability, or other basis prohibited by state law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the Contractor. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

(b) The Contractor, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, will state that such Contractor is an equal opportunity employer.

(c) Notices, advertisements and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.

The Contractor will include the provisions of the foregoing paragraphs a, b, and c in every subcontract or purchase order of over $10,000, so that the provisions will be binding upon each Subcontractor or vendor.

Article 17: Claim Process

The OWNER and CONTRACTOR each hereby waive all right to trial by jury in any matter arising out of or in any way connected with this CONTRACT or their relationship, whether contractual or extra-contractual. They agree that prior to the assertion of any claim against the other, they will endeavor to resolve the claim through discussion, including the optional use of non-binding mediation. Absent agreed resolution, the process to assert a claim against the City is to present it in writing to the Appropriate City Department Director; and absent acceptance of the decision of the Director of Public Works, then appeal in turn to the City Manager or designee and ultimately to Council, with each such appeal to be submitted in writing within 10 calendar days of prior decision, identifying in writing on what specific basis, with citation to controlling and supporting documentation and legal authority, the appeal is sought and challenge made to the prior decision and the resolution or remedy which would be acceptable. With any claim that reaches City Council, the City Council shall decide the claim within 60 days of when it was submitted to the City Manager or designee.

SPECIAL & SUPPLEMENTARY CONDITIONS

FY 19 WATER LINE IMPROVEMENTS

These Special & Supplementary Conditions amend or supplement the General Conditions & Specifications and other provisions of the Contract Documents as indicated. All provisions which, are not so amended or supplemented, remain in full force and effect.

- Sections 110.4 and 111.4 of the Technical Specifications are revised. There shall be no separate payment for restoration of bituminous pavement, concrete, aggregate shoulders, or lawns. Associated cost shall be included in related bid items.

- Section 109.4.13 of the Technical Specifications is revised. Payment for water lines and all appurtenances shall be made after completion of ditch restoration including bituminous pavement, concrete, aggregate shoulders, and lawns.

- Full stone backfill will be used only at the discretion of the City Engineer where native backfill is deemed unsuitable.

- All water service connections shall be replaced from water main to water meter using ¾" Polyethylene (PE) Pressure Pipe (Municipex or approved equal) with tracer wire excepting the 2" water service indicated on Plan Sheet 6 (5 of 12 Sterling Street Waterline).

- All non-ferrous material shall follow Section 107.2.4 which states:
  Conduits of non-ferrous material buried underground shall have a detectable tracer buried in the trench approximately 18 inches above the conduit, but no less than 24 inches below grade. Detectable tape shall have a metallic core, 14 gage or larger, protected by a plastic jacket. The tape shall be continuously marked indicating that a water line is buried beneath the tape. Copper wire, 14 gage or larger.

- Standard Drawing Number W-1, revised 8-23-2018, included in these contract documents supersedes the W-1 drawing/detail shown on Sterling Street Waterline plan sheet 11 of 12.

SECTION 101 - MOBILIZATION

101.1 GENERAL

Work shall consist of performing preparatory operations, moving personnel and equipment to the job site, paying bonds and insurance premiums and establishing a Contractors field office.

101.2 MEASUREMENT & PAYMENT

When listed as a separate pay item, mobilization will be paid for at the rate of 50% with the first month's request for payment and 50% with the second month's request for payment. The mobilization bid shall not exceed 10% on projects with a value less than $200,000 and 7.5% on projects over $200,000. If mobilization is not listed as a separate pay item, it will be considered incidental to all other work and the cost distributed accordingly.

SECTION 102 - TRAFFIC CONTROL

102.1 GENERAL

All traffic control devices and traffic patterns shall conform to the standards in the Manual of Uniform Traffic Control Devices (MUTCD) and the Virginia Work Area Protection Manual unless shown otherwise on the plans.

102.1.1 Referenced Specifications are referred to by abbreviation as follows:

A. Manual of Uniform Traffic Control Devices (MUTCD)

B. Virginia Department of Transportation (VDOT)

C. Virginia Work Area Protection Manual (VWAPM)

102.1.2 The contractor is responsible for providing the required signage and cones.

102.1.3 All signage and traffic control shall be subject to the City's approval. No rerouting of traffic or street closings will be done without prior approval from the City.

102.1.4 All traffic cones are to be 36" tall and clean.

102.1.5 When left unattended, any work zone adjacent to a City street shall have lighted barricades every 30'. No open excavations will be permitted overnight in a City right-of-way.

102.1.6 Rerouting of traffic shall be delineated with traffic cones.

102.1.7 Flagmen must be used when stopping traffic and for equipment entering and exiting a work zone.

102.1.8 All flagmen shall be certified by VDOT and be in possession of a valid flagging card.

102.2 MEASUREMENT AND PAYMENT

When listed as a separate bid item, Traffic Control will be paid for as a lump sum item. Payment will be made as a percentage of the associated items that are completed. When there is not a separate bid item for Traffic Control, it will be considered incidental to all other work and the cost distributed accordingly.

SECTION 103 - SITE CLEARING

103.1 GENERAL

This section provides for general site clearing operations, including trees and vegetation removal, protection of existing trees to be left standing, and clearing and grubbing.

103.1.1 Related requirements specified in other Sections of the Specifications.

A. Section 104 - Trenching & Backfilling

B. Section 106 - Seeding

103.1.2 Provide barricades, coverings, or other types of protection necessary to prevent damage to existing improvements not indicated to be removed, and improvements on adjoining properties.

103.1.3 Protect existing trees and other vegetation indicated to remain in place against cutting, breaking, or skinning of roots, skinning and bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide temporary fences, barricades or guards as required to protect trees and vegetation to be left standing.

103.1.4 Burning where allowed by local ordinances will be allowed by permit only.

103.2 EXECUTION

103.2.1 Clearing

A. Remove from the site trees, brush, shrubs, down timber, rotten wood, rubbish, other vegetation, including stumps, as well as fences, and incidental structures necessary to allow for new construction.

B. Clearing work shall be restricted to area within rights-of-way or easements or within "Construction Limits" indicated on Drawings.

103.2.2 Existing Trees and Shrubs

A. Trees and shrubs that are to remain within "Construction Limits" shall be marked by the owner prior to clearing operations.

B. Ownership of Trees: Unless otherwise noted, felled trees within the "Construction Limits" shall become the property of the Contractor and shall be removed from the site.

C. Use only hand methods for grubbings inside the drip lines of trees which are to remain.

103.2.4 Clean up debris resulting from site clearing operations continuously with the progress of the work.

103.2.5 Remove all waste material from site.

103.2.6 Remove debris from site in such a manner as to prevent spillage. Keep pavement and area adjacent to site clean and free from mud, dirt and debris at all times.

103.3 MEASUREMENT AND PAYMENT

When listed as a separate bid item, Site Clearing shall be paid for as a lump sum. When not listed as a separate bid item, Site Clearing shall be considered incidental to associated work items.

SECTION 104 - TRENCHING & BACKFILLING FOR UTILITY LINES

104.1 GENERAL

Work included in this Section includes trenching and backfilling for underground pipelines and related structures only.

104.1.1 Related requirements specified in other Sections of the Specifications.

A. Section 102 - Traffic Control

B. Section 103 - Site Clearing

C. Section 105 - Rock Excavation

D. Section 106 - Seeding

E. Section 107 - Sanitary Sewer System

F. Section 108 – Storm Drainage System

G. Section 109 - Water Distribution System

104.1.2 Reference Specifications are referred to by abbreviation as follows:

A. American Society for Testing and Materials - ASTM

B. American Assoc. of State Highway and Transportation Officials - AASHTO

C. Virginia Department of Transportation - VDOT

104.1.3 The Contractor shall provide compaction testing as deemed necessary by the City.

104.1.4 Locate existing utilities, culverts and structures, above and/or below ground, before any excavation starts. Coordinate work with utility companies. Protect, maintain in service, and prevent damage to utilities not designated to be removed. When utilities are encountered and are not shown on Drawings or when locations differ from those shown on Drawings, notify Engineer for instructions before proceeding.

104.2 PRODUCTS

104.2.1 Pipe Bedding Fill

Granular fill shall meet requirements for VDOT #68 or #57 aggregate.

104.2.2 Select Backfill

A. Aggregate fill shall be VDOT #21A.

B. Clean earth fill shall be approved material free of debris, roots, frozen materials, organic matter, rock or gravel larger than 2 inches in any dimension or other harmful matter.

C. Flowable Fill shall conform to VDOT Road and Bridge Standards and VDOT Special Provision for Flowable Fill

104.2.3 Concrete for bedding, backfill or encasement shall have at least 2,000 psi compressive strength.

104.2.4 Rip rap, where shown on the Drawings shall conform to VDOT Road and Bridge Specifications.

104.3 EXECUTION

104.3.1 Strip existing topsoil, leaf mold and organic materials, meeting topsoil requirements of Section 106 - "Seeding." Deposit in storage piles separate from other excavated material.

104.3.2 Unauthorized excavation consists of the removal of material beyond indicated subgrade elevations or side dimensions without specific approval of the City Engineer. Where unauthorized excavations occur, restore these areas to the elevations and dimensions shown on the Drawings with granular fill.

104.3.3 Where removal of unsatisfactory material is due to fault or negligence of the Contractor, by inadequate shoring or bracing, dewatering, material storage or other failure to meet specified requirements, any work deemed necessary by the City Engineer to correct the faulty condition shall be performed at no additional cost.

104.3.4 Excavation and Bedding

A. Open trenches are limited to 100'.

B. The width of the trench at and below the top of the pipe shall be the outside diameter of the pipe plus 24 inches.

C. The trench width shall be of adequate width to allow for a mechanical compactor between the pipe and the trench wall.

D. Pressure lines shall be installed with bedding as indicated in the Standard Drawings.

E. Gravity sewer lines in good material shall be installed with a modified class B bedding as shown on standard drawing S-8.

F. Dewater excavation as necessary to provide proper protection. If deemed necessary, the Engineer may require continuous dewatering 24 hours per day by adequate pumping or well-points until backfilling is completed. The method, and equipment used for dewatering shall be subject to the approval of the Engineer.

G. Where unsuitable soil is encountered, excavate to depth determined by the City Engineer and replace with suitable material approved by the City Engineer.

H. Where underground streams or springs are found, provide temporary drainage and notify City Engineer.

I. Remove from the project site and dispose of material unsatisfactory for backfill, trash, and all excess material continuously with the progress of the work.

J. Remove shoring and all form materials, unless otherwise directed.

K. Where rock is encountered which will serve as a foundation for a manhole, vault, or other structure, it shall not be removed. Where only a part of the foundation would bear on rock, excavate to an even depth of 8 inches below the entire structure and backfill with aggregate fill and thoroughly compact. Provide a minimum of 8 inches between rock excavation and sides of structures.

L. Compact pipe bedding by mechanical tamping to prevent settlement.

104.3.5 SHEETING

A. Maintain trench walls in a safe condition at all times. The City Engineer reserves the right to require the use of sheeting and/or shoring at any time the Engineer deems it necessary.

B. Sheeting and shoring left in place shall be cut off to a depth of not less than 18 inches below finish grade.

104.3.6 COMPACTION

Percentage of maximum density requirements:

Compact each layer of fill or backfill to not less than the following percentages of the maximum density at optimum moisture content as determined by ASTM D 698 (AASHTO T-99):

A. 100 percent beneath and within 25 feet of buildings and structures, including those shown for future construction.

B. 95 percent beneath pavements, walks, and road shoulders, including those shown for future construction.

C. 90 percent in other unpaved areas.

104.3.7 BACKFILL

A. Backfill trench to a compacted depth of 1 foot over the pipe with approved earth fill. Backfill shall be properly placed uniformly on each side of the pipe and compacted as required. Do not backfill on muddy or frozen soil, or with muddy or frozen soil.

B. Backfill over any plastic or PVC pipe to 1' over the top of the pipe with VDOT #68 or #58 aggregate.

C. Backfill trench from 1 foot above the pipe to grade with clean earth fill free of stones larger than 6 inches or 1/2 the layer thickness, whichever is smaller. Layers shall not exceed 12 inches, except that under road shoulders and under existing or future paved areas, layers shall not exceed 8 inches. Backfill shall be compacted to the density specified for the areas in which it is located except that minimum compaction in any area shall be to the density of the adjacent soil. Compaction shall be achieved by vibratory mechanical tamping.

D. When specified the trench shall be backfilled full depth with VDOT 21A aggregate.

E. When specified the trench shall be backfilled from 6” above the pipe to the bottom of the pavement repair detail with VDOT Flowable Fill.

F. Excavation depressions caused by removal of stumps or other clearing operations to firm subgrade shall be filled with clean earth fill and compacted as specified.

G. Place backfill materials adjacent to structures evenly. Take care to prevent wedging action of the backfill against structures by carrying the material uniformly around the structure to approximately the same elevation in each lift.

H. Compact backfill materials using equipment suitable for the materials being compacted and the work area locations. Use power-driven hand tampers for compacting materials adjacent to structures.

I. Compact aggregate fill placed under manholes or other structures to required density.

104.3.8 GRADING

A. Uniformly grade all areas within the limits designated on the Drawings, including adjacent transition areas.

B. Finish all surfaces to be free from irregular changes.

C. Finish subgrade areas to receive topsoil to within 0.10 foot of required subgrade elevations.

D. Shape subgrade under walks to line, grade, and cross-section to within 0.10 foot of required subgrade elevations.

E. Shape subgrade under pavement to line, grade, and cross-section to required subgrade elevations.

F. Protect newly graded areas from traffic and erosion. Repair and reestablish grade in settled, eroded, or rutted areas to the specified tolerances.

G. Where compacted areas are disturbed by subsequent construction or adverse weather scarify the surface, reshape and compact to the required density. Use hand tamper for recompaction over underground utilities.

104.3.9 UTILITIES TO BE ABANDONED OR REMOVED

A. When underground utilities are to be abandoned in place, plug, cap or seal with concrete at the "construction limits" or at points shown.

B. Remove underground utilities indicated on the Drawings to be removed and backfill resulting excavation with suitable material compacted as specified. Plug, cap or seal utilities with concrete, at the construction limits or at points shown.

104.3.10 CLEAN UP

A. Keep areas of work cleaned up at all times, and promptly remove all materials and debris not intended for incorporation in the work. Broom clean the surfaces of all paved areas immediately after backfilling operations.

B. Maintain backfilled trenches from the nuisance of dust, mud or settling during the entire length of the Contract and for a period of one-year following Final Acceptance of the Work.

C. In the event the Contractor fails to satisfy these requirements to the satisfaction of the City, or otherwise prosecute the Work in a reasonable or proper manner, and after a reasonable period of time has elapsed after notification by the City of unsatisfactory conditions, the City reserves the right to employ outside services to take such corrective action as deemed necessary by the City Engineer. The cost incurred in taking corrective actions will be deducted from any monies due the Contractor by the City or such other means of collection as may be available to the City.

104.3.11 PREPARATION FOR FINAL INSPECTION

Locate and adjust all manholes, valve boxes, etc. to final grade and flush out all gravity pipelines as necessary prior to final inspection by the City Engineer.

104.4 MEASUREMENT AND PAYMENT

A. Excavation - Excavation for utility work is incidental to all other work. No separate payment is made.

B. Rip Rap - When specified as a separate bid item, rip rap will be paid for by the ton or square yard for the Class specified.

C. Backfill - When there is not enough suitable backfill material on site, VDOT 21A Aggregate shall be used and paid for by the ton. Otherwise there is no separate payment for backfill.

D. Full Stone Backfill - When specified as a separate bid item, the entire trench depth will be backfilled with VDOT 21A Aggregate. Payment will be for the linear footage of trench backfilled with stone.

E. Bedding Stone - The specified pipe bedding stone shall be incidental to the cost of the pipe.

F. Trench Stabilization- Shall be #1 or #3 aggregate (as directed by the City Engineer) used to replace over excavation of unsuitable material below the typical bedding line. Placement shall be as directed by the City Engineer. Payment shall be by the TON and shall include the cost of removal and disposal of the unsuitable material.

G. Flowable Fill Backfill - When specified as a separate bid item, the trench shall be backfilled from 6” above the pipe to the bottom of the pavement repair detail with VDOT Flowable Fill. Payment will be for the linear footage of trench backfilled with Flowable Fill.

SECTION 105 - ROCK EXCAVATION

105.1 DESCRIPTION OF WORK

105.1.1 Furnish all labor, material and equipment to excavate rock and dispose of rock as specified herein.

105.2 REQUIREMENTS OF REGULATORY AGENCIES

105.2.1 Observe all municipal ordinances and State and Federal laws relating to the transportation, storage, handling and use of explosives.

105.2.2 Blasters shall be duly licensed and shall have their license on the work site at all time during blasting activities.

105.3 DEFINITION

105.3.1 The word "rock," wherever used as the name of an excavated material or material to be excavated, shall mean solid ledge rock which, in the opinion of the City Engineer, requires, for its removal, drilling and blasting or mechanical hammer.

105.3.2 No soft or disintegrated ledge rock, no loose, shattered, or broken stone, regardless of size, in rock fills or elsewhere; no frozen earth or existing paving; and no rock exterior to the maximum limits of measurement allowed, which may fall into the excavation, will be measured or allowed for payment as rock excavation.

105.4 EXECUTION

105.4.1 Excavate rock to the lines and grades indicated on the drawings and as specified in 105.6 - Measurement and Payment. Dispose of excavated material not suitable for backfill in a location approved by the Owner.

105.4.2 Excavate rock in trenches to 6-inches below the bottom of the pipe to be installed.

105.4.3 Excavate rock in structure excavations to 6" below the bottom of the foundation.

105.4.4 Conduct operations involving explosives by experienced personnel only, with all possible care to avoid injury to persons and damage to property.

105.4.5 Blast only with such quantities and strengths of explosives and in such manner as to break the rock approximately to the intended lines and grades.

105.4.6 Care shall be taken to avoid excessive cracking of the rock upon or against which any pipe or structure will be built, and to prevent damage to existing pipes or other structures and property above or below ground.

105.4.7 Cover rock with blasting mats where required.

105.4.8 Give sufficient warning to all persons in the vicinity of the work before a charge is detonated. Employ flagmen to stop or direct traffic as required.

105.4.9 When required by the City, the contractor shall have a seismograph on site to monitor vibration.

105.5 EXCESS ROCK EXCAVATION

105.5.1 If rock is excavated beyond the limits of excavation indicated on the drawing, specifications, or not authorized in writing by the Engineer, the excess excavation, whether resulting from over breakage or other causes, shall be backfilled, by and at the expense of the Contractor, as specified below.

105.5.2 In pipe trenches, excess excavation below 6" from the bottom of the pipe shall be filled with material of the same type, placement and compaction as specified for the bedding.

105.5.3 In excavations for structures, excess excavation in the rock beneath foundations shall be filled with 3,000 psi concrete. Other excess excavation shall be filled with earth.

105.5.4 If rock below normal depth is shattered due to drilling or blasting operations and such shattered rock is unfit for foundations, the shattered rock shall be removed and the excavation shall be backfilled as described in "EXCESS ROCK EXCAVATION." All such removal and backfilling shall be classified as excess rock excavation.

105.5.5 Keep and submit to the Engineer an accurate record of each blast. The record shall show the general location of the blast, the depth and number of drill holes, the kind and quantity of explosive used, and other data required for a complete record.

105.6 MEASUREMENT AND PAYMENT

105.6.1 The contractor shall notify the owner when rock measurements can be performed. If backfill commences before measurement is made, the contractor will not be paid for that portion of the rock removed. Maximum measurement for rock excavation in pipe trenches shall be to six (6) inches below bottom of pipe with the width of trench at 2' 0" plus the interior diameter of pipe, regardless of the excess width excavated. Maximum measurement for precast and cast-in-place structures shall be structure width plus four (4) feet; structure length plus four (4) feet; and base of structure. Payment shall be the price bid per cubic yard and is to include aggregate fill to bring the ditch to plan grade.

SECTION 106 - SEEDING

106.1 GENERAL

106.1.1 Related requirements specified in other Sections of the Specifications:

Section 104 - Trenching & Backfilling

106.1.2 Reference Specifications are referred to by abbreviation as follows:

American Society for Testing and Materials - ASTM
Virginia Department of Transportation - VDOT

106.1.3 Submit two copies of the following:

A. Seed Test Report
B. Fertilizer Analysis

106.1.4 Materials shall be delivered in unbroken containers, clearly marked by the manufacturer as to contents. Seed, lime, and fertilizer shall be labeled as to proportions, analysis and quality. Store all materials in a manner affording protection from damage by weather or vandalism.

106.1.5 Seed only when wind velocity is less than 15 miles per hour.

106.2 PRODUCTS

106.2.1 Topsoil shall be the top 4 inches or original soil from the site, unless otherwise noted on the Drawings. Topsoil obtained off-site shall be fertile, friable loam or silt, containing not less than 2 pct., by weight, of finely divided, decomposed vegetable matter. Topsoil shall be free of subsoil, clay lumps, brush, weeds, roots larger than 1/2 inch diameter, stones larger than 1/2 inch diameter and other material toxic or harmful to growth.

106.2.2 Fertilizer shall be 5-10-5 applied at 1000 pounds per acre.

106.2.3 Seed mixture shall be 40% lawn fescue, 40% lawn bluegrass, 10% annual rye grass and 10% white Dutch clover applied at 5 pounds per 1000 square feet unless otherwise specified.

106.2.4 Lime shall be ground agricultural grade lime containing not less than 85 pct. calcium and magnesium carbonates. Fineness shall be such that 100 pct. will pass a No. 20 sieve, not less than 50 pct. will pass a No. 100 sieve. Burnt lime or hydrated lime may be substituted in equivalent carbonates, if requested.

106.2.5 Mulch shall be clean, seed free, loose, unweathered, unchopped small grain straw. Spray mulch of an approved wood cellulose fiber material that is in accordance with the Virginia Department of Transportation (VDOT) specifications shall be accepted.

106.2.6 Sod shall be composed of at least 70 pct. of Kentucky 31 tall fescue and be cut to provide a minimum thickness of 2 inches. Vegetation more than 5 inches in height shall be cut to 3 inches or less before sod is lifted.

106.3 EXECUTION

106.3.1 Prepare soil for permanent seeding by tilling of topsoil in place to loosen thoroughly and break up all clods to a depth of 6 inches. Remove all stumps and roots, coarse vegetation, stones larger than 1-1/2 inches and all construction debris. Soil shall be worked by suitable agricultural equipment to a depth of not less than 4 inches. Rake to a uniform, smooth and drainable surface.

Apply lime and fertilizer uniformly and mix well into top 4 inches of seed bed. Apply lime at the rate of 100 lbs. per 1000 sq. ft. Apply fertilizer at the rate of 50 lbs. of 5-10-5 per 1000 sq. ft.

106.3.2 Sow permanent grass seed between dates of March 15 and May 31 or August 15 and October 31st unless otherwise approved. Temporary seeding and/or mulching is required at all other times.

106.3.3 Sow seed by mechanical seeder as follows:

A. Mix seed thoroughly with clean dry sawdust and broadcast at rate of 5 lbs. of seed per 1000 sq. ft. in cross directions to ensure uniform distribution. Rake surface lightly and roll with appropriate type of lawn roller weighing maximum of 150 lbs. per foot of width.

B. Protect the complete seeded area against erosion by mulching with straw at a rate of one (1) bale per 1000 square feet or by spray mulching with a wood cellulose fiber material applied by hydro-jet method at a rate of 35 pounds (dry weight) per 1000 square feet, in accordance with the VDOT Standard method.

C. Anchor mulch by the following methods.

(1) In residential areas, apply synthetic mulch binder at rate recommended by manufacturer.

(2) On slopes steeper than 4 horizontal to 1 vertical, fasten heavy jute mesh to wooden stakes.

106.3.4 Remove all soiling or staining of finished walks, drives and parking areas resulting from seeding work. Maintain paved areas in clean condition.

106.3.5 Turfgrass Maintenance

A. Water as required to keep soil moist during germination period.

B. Mowing

(1) When grass reaches height of 3-1/2 to 4 inches, mow to height to 2-1/2 inches.

(2) Maintain grass height between 2-1/2 and 4 inches.

(3) Do not remove more than 33 pct. of total height of grass in one mowing.

C. Reseed and mulch spots larger than 1 square foot without uniform stand of grass.

D. Mow and maintain all seeded areas until uniform stand of grass is acceptable to Engineer.

E. In the event that growth is not established by final project inspection, continue the specified attention until stand is accepted by Engineer.

F. Correct or repair all undue settling as evidence by complaints received within one year after final inspection.

106.4 HYDROSEEDING

A. The Contractor may elect the use of approved hydraulic seeder (s) for the application of seed and mulch.

B. Hydraulic applications shall not begin until the topsoil preparation and the lime application has been completed, as specified herein. The method shall be in accordance with VDOT specifications.

C. Hydraulic Seeder(s) shall be equipped with an agitation system capable of maintaining all mixture solids in complete suspension and shall be equipped with spray nozzles that produce an even distribution.

D. Wood Fiber Mulch shall consist of specially prepared wood cellulose fibers. Mulch shall not contain growth or germination inhibiting factors. Mulch shall be dyed an appropriate color to facilitate visual detection during application.

E. Slurry mix for hydro seeding shall supply the following rates per acre:

Kentucky 31 Tall Fescue (100%) or,	32 pounds
Kentucky 31 Tall Fescue (67%) and,	21.5 pounds
Red Creeping Fescue (33%)	10.5 pounds
Fertilizer 10-20-10	1,000 pounds
Wood Fiber Mulch, or	1,500 pounds
Straw tacked with,	3,000 pounds
Wood Fiber	750 pounds

106.5 INSPECTION AND ACCEPTANCE

106.5.1 At the beginning of the next planting season after that in which the permanent grass crop is sown, the seeded areas will be inspected. Any section not showing dense, vigorous growth at that time shall be promptly reseeded by the Contractor at his own expense. The lawns shall be watered, weeded, cut and otherwise maintained until the end of that planting season, when they will be accepted.

106.6 MEASUREMENT AND PAYMENT

106.6.1 Topsoil and Seeding. Measurement and payment shall be per acre or lump sum as listed on the Bid Schedule. When there is no topsoil and seeding bid item the work is considered incidental to other associated work items.

106.6.2 Sod – when specified sod shall be paid for by square foot.

106.6.3 Maintenance – There shall be no separate payment for maintenance of seeded or sodded areas.

SECTION 109 - WATER DISTRIBUTION SYSTEM

109.1 GENERAL

Work in this Section includes all water system piping including all valves, hydrants, fittings, anchors, air vents and other appurtenances or material as indicated on the construction plans.

109.1.1 Related requirements specified in other Sections of the Specifications:

A. Chapter 8 - General Construction Standards

B. Section 103 - Site Clearing

C. Section 104 - Trenching & Backfilling

D. Section 106 - Seeding

E. Section 107 - Sanitary Sewer System

109.1.2 Reference Specifications are referred to by abbreviation as follows:

A. American National Standards Institute - ANSI

B. American Railway Engineering Association - AREA

C. American Society for Testing and Materials - ASTM

D. American Water Works Association - AWWA

109.2 EXISTING FACILITIES

A. Domestic Water Service - It shall be the Contractor's responsibility to maintain water service to residents during the life of this project; however, during different phases of construction, it will be necessary to temporarily disrupt water service. Any disruption of water service shall be to the Owner's approval and the Contractor shall give residents sufficient warning of the disruption.

B. Abandoned Facilities - The Contractor shall abandon the existing water lines by closing valves, cutting/sleeving lines, removing valve boxes, and plugging the lines as directed by the City or as shown on the plans. The Contractor shall remove abandoned fire hydrants as directed. All salvageable materials will be delivered to the City's storage yard. All work associated with this Article will be considered incidental to the project and will have no separate pay item unless specifically identified on the bid schedule.

109.3 PRODUCTS

A. Submit shop drawings on all products as required by the City.

B. Provide certified test results of pipe testing.

109.3.1 Ductile iron pipe shall meet requirements of AWWA C151, Class 350. All pipe shall have a cement mortar lining on the interior and a bituminous coating on the exterior. Unless otherwise noted, all joints shall be slip joints.

109.3.2 Copper tubing shall meet requirements of ASTM B88 for Type "L" copper, hard drawn, for above ground and Type "K" hard drawn for below ground.

109.3.2.1 Polyethylene (PE) Pressure Pipe and tubing shall meet requirements of AWWA C904 and NSF/ANSI 61, 1/2 inch (13mm) through 3 inches (76mm) for Water Service. PE tubing shall be minimum pressure class 200, copper tube size, meeting the requirements pf AWWA C904. Couplings for use in joining gravity pipe of differing materials and/or sizes shall be push on type.

109.3.3 2" thru 3" Water Line - To be galvanized steel pipe, exceeding requirements of ASTMAS3, threaded joint, with malleable iron fittings.

109.3.4 Steel casing pipe for boring, jacking, or open cutting under highways and railroads shall meet the requirements of ASTM A139, Grade B. Nominal pipe diameter shall be as indicated on the Drawings. Wall thickness shall be a minimum of 0.375": No protective coating or lining will be required.

109.3.5 Fittings shall be ductile iron. Ductile iron fittings shall be in accordance with AWWA C110 or C153. Pressure rating shall be 350 psi All fittings shall be mechanical joint, or mechanical joint plain end unless otherwise approved by the Engineer. All fittings shall have a cement mortar lining on the interior and a bituminous coating on the exterior in accordance with AWWA C104.

109.3.6 Ductile Iron Fittings - To be ANSI & AWWA Specification, cement line, Class 350 with mechanical joints.

A. Mechanical joint retainer glands shall meet requirements of AWWA C111 except that retainer gland shall be modified to accommodate set screws.

B. Locked type mechanical joints may be used where restrained joints are required.

109.3.7 Push-on joint and rubber gasket shall meet requirements of AWWA C111.

Restrained push-on joints may be used where restrained joints are required.

109.3.8 Flanged joints for ductile iron pipe shall meet requirements of ANSI B16.1.

109.3.9 Flanged joint gaskets shall be full-face, made of rubber, and shall meet requirements of ANSI B16.21.

109.3.10 Cement mortar lining with bituminous seal coat for ductile iron pipe and fittings shall meet requirements of AWWA C104.

Cement mortar lining shall be standard thickness.

109.3.11 Exterior, bituminous coating for ductile iron pipe and fittings and shall meet requirements of AWWA C106 or AWWA C151 as applicable.

109.3.12 Metal harness shall be galvanized rods and clamps as detailed on Drawings.

109.3.13 Detector Check Valves

Detector Check Valves shall be epoxy coated UL and FM approved, hot dipped galvanized cast iron with brass by-pass meter trim. Valves shall be ITT Grinnell/Kennedy Model 1371G, or 1369G Hersey Model EDC, Mueller #4-2133-6, Viking Model E-1, Ames 3000 DCDA 4"-10", Wilkins 950 DA 2-1/2"-10", Grinnell Model B-2 detector check valves, or approved equal.

109.3.14 Gate Valves

A. Gate valves, smaller than 12 inches shall be iron body, nonrising bronze stem and resilient wedge gates meeting the requirements of AWWA C509 or AWWA C515. Valve ends shall be mechanical joint for underground service or flanged for meter vaults and above ground service. Valves shall open counter-clockwise and shall be equipped with a 2-inch square AWWA operating nut. Valves shall be factory tested in accordance with AWWA C509 and upon request the manufacturer shall furnish certified copies of test reports.

B. Valves shall be American Flow Control, Clow, Dresser, Kennedy, Mueller, A.P. Smith, or approved equal meeting this Specification.

109.3.15 Butterfly Valves

A. Butterfly valves, 12 inches through 24 inches shall be of the rubber-seated tight closing type meeting requirements of AWWA C504, Class 250B.

B. Valve ends shall be mechanical joint in accordance with AWWA C111. Accessories (bolts, glands, and gaskets) shall be supplied by the valve manufacturer.

C. Valve operators shall be of the traveling-nut type, sealed, gasketed and lubricated for underground service. Operators shall be capable of withstanding an input torque of 450 ft. lbs. at full open or closed position, without damage to the valve and valve operators.

D. A rubber seat may be applied to the body or the disc.

E. Valves shall open counter clockwise and shall be equipped with a 2-inch square AWWA operating nut.

F. Valves shall be factory tested in accordance with Section 5 AWWA C504 specification; and upon request, the manufacturer shall furnish certified copies of test reports.

G. Valves shall be American-Darling, Dresser "450", Mueller “Lineseal XP”, Pratt “HP 250II”, or approved equal.

109.3.16 “Hot Tap” valves shall be the equivalent of The Romac 7.00 310-0700010 Quickvalve and sleeve. Valves shall open counter clockwise and shall be equipped with a 2” square operating nut.

109.3.17 Valve boxes shall be 2 piece adjustable screw type, cast iron, Tyler Model No. 562-S or Capitol Foundry Model No. 562-S-HD.

109.3.18 Pressure Reducing Valve.

A. Valves shall be hydraulically operated and shall generally function to reduce high upstream pressure to a preset lower downstream pressure without shock or hammer.

B. The valve body shall be cast iron with 125 lb flanges. The piston shall be guided above and below the seat. The piston, seat, and guide shall slide on replaceable "leathers." No metal to metal sliding contact will be allowed.

C. The valve body shall be constructed to allow the removal and servicing of all parts without removing the valve body from the water line. An indicator shall be furnished as an integral part of the valve to show piston position within the body.

D. The working pressure (both HIGH PSI and LOW PSI) shall be determined by the Engineer, approved by the City and shown on the Plans. The valve shall be ordered with the PSI specified and the factory shall preset the pilot for the specified pressure.

E. The external pilot (although preset to the specified pressure when shipped from the factory) shall be field adjustable between 40 and 100 PSI.

F. The valve shall be a Cla-Val or approved equal.

109.3.19 Tapping Sleeve and Valve - Shall be Mueller H-615 tapping sleeve with duck tipped end gasket and H-667 tapping valve open left, or approved equal. The contractor shall provide all material and labor with the exception that the City will use its tapping machine to make the tap. The contractor needs to schedule this service with the City's Utilities Superintendent. An alternate tapping sleeve

can be all stainless steel (18-8 type 304) Style FAST as manufactured by Ford Meter Company, or approved equal.

109.3.20 Flexible couplings shall be of gasketed, sleeve type. Each coupling shall consist of a steel middle ring, two steel followers, two rubber compounded wedge section gaskets and sufficient galvanized track, head steel bolts to properly compress the gaskets. Couplings shall be of the type to match piping in which installed. Couplings shall be manufactured by Dresser Manufacturing Division of Dresser Industries, Smith-Blair, Ford, or approved equal.

109.3.21 Fire Hydrants - To be Mueller "Centurion" Model A-421 or Kennedy "Guardian" with 6" shoe, mechanical joint, two 2 1/2" hose nozzles, or approved equal, and one 4 1/2" pump connection with National Standard outlet threads, left turn open with 1 1/2" pentagon operating nut. Hydrant bury mark to match ground surface. One cubic foot stone pocket to be installed at Hydrant Drain. Hydrants to be painted according to AWWA standards. All paints currently being used are Pittsburg Paints Interior/Exterior Gloss Oil, other equivalent paints are acceptable. The colors and Pittsburg code follows:

Blaze Orange	6-313
Black	6-253
Safety Yellow	6-330
Brilliant Red	6-306
Ivy Green	#7013

109.3.22 Flanged adapters for joining plain-end pipe to flanged items shall be Style 128 or 127 as manufactured by Dresser Manufacturing Division of Dresser Industries or Smith-Blair Type 912 or 913, or approved equal.

109.3.23 Pressure gauges shall be open front case type with bronze bourdon tube soldered to socket and tip, stainless steel movement, and a 4-1/2 inch white coated dial graduated from 0 to 100 psi. Gauges shall be similar to Ashcroft No. 1279.

109.3.24 Concrete Thrust Blocks - Install concrete thrust blocks at all appurtenances except under valves. Concrete to be Class C1-1500 psi using Type I cement. Contractor may use retainer glands in lieu of concrete thrust blocks for 11 1/4 and 22 1/2 bends. The MEGAlug by Ebba Iron, INC., or approved equal, is an acceptable alternate.

109.3.25 Service Connection - The Type I service connection shall include corporation stop, water main tap, replacement of meter yoke assembly and box (furnished by the City), connection of service line to both sides of yoke assembly, and connection to the existing service line behind the meter with check valve installed.

The Type II connection shall include water main tap, corporation stop, and connection of the service line to the existing service line at it's point of connection to the existing water main with a three part union or compression

coupling. All galvanized service lines encountered shall be treated as a Type I service connection.

The Type III Service Connection includes a 1" Corporation Stop, water main tap, splitting the service line with a "Y", placement of two (2) meter yokes assembly and box and connection of service line to both sides of the yoke assembly and connection to the existing service line behind the meter with check valve.

109.4 EXECUTION

109.4.1 Pipe Laying

A. Take all precautions necessary to insure that pipe, valves, fittings, and other accessories are not damaged in unloading, handling, and placing in trench. Examine each piece of material just prior to installation to determine that no damage has occurred. Remove any damaged material from the site and replace with undamaged material.

B. Exercise care to keep foreign material and dirt from entering pipe during storage, handling, and placing in trench. Close ends of in-place pipe at the end of any work period to preclude the entry of animals and foreign material.

C. Bedding of pipe shall be as specified in Section 104 - Trenching & Backfillings.

D. Do not lay pipe when the trench bottom is muddy or frozen, or has standing water.

E. Use only those tools specifically intended for cutting the size, material, and type pipe involved. Make cuts to prevent damage to pipe or lining and to leave a smooth end at right angles to the axis of the pipe.

F. Lay pipe with bell ends facing the direction of laying. Where grade is 10 percent or greater, lay pipe uphill with bell ends upgrade.

G. Separation of sanitary sewer lines and water lines shall be in accordance with Virginia Department of Health and Regulations.

109.4.2 Joining Mechanical Joint Pipe

A. Thoroughly clean inside of the bell and 8 inches of the outside of the spigot end of the joining pipe to remove oil, grit, excess coating and other foreign matter. Paint the bell and the spigot with soap solution (half cup granulated soap dissolved in 1 gallon water). Slip cast-iron gland on spigot end with lip extension of gland toward end of pipe. Paint rubber gasket with or dip into the soap solution and place on the spigot end with thick edge toward the gland.

B. Push the spigot end forward to seat in the bell. Then press the gasket into the bell so that it is located evenly around the joint. Move the gland into position, insert bolts and tighten nuts finger tight. Then tighten all nuts to the torque listed below:

Bolt Size - Inches	Torque Foot-Pounds
5/8	40-60
3/4	60-90
1	70-100
1-1/4	90-120

Tighten nuts on the alternate side of the gland until pressure on the gland is equally distributed.

C. Join lock-type mechanical joint pipe according to manufacturer's recommendations.

D. Permissible deflection in mechanical joint pipe shall no be greater than 2/3 of that listed in AWWA C600.

E. Permissible deflection in lock-type mechanical joint pipe shall be as recommended by manufacturer.

109.4.3 Joining Push-On Joint Pipe

A. Thoroughly clean inside of the bell and 8 inches of the outside of the spigot end of the joining pipe to remove oil, grit, excess coating, and other foreign matter. Flex the rubber gasket and insert it in the gasket recess of the bell socket. Apply a thin film of gasket lubricant supplied by the pipe manufacturer, to either the gasket or the spigot end of the joining pipe. Start the spigot end of the pipe into the socket with care. Then complete the joint by forcing the plain end of the bottom of the socket with a forked tool or jack-type device. File the end of field cut pipe to match the manufactured spigot end.

B. Join restrained push-on joints according to the manufacturer's recommendations.

C. Permissible deflection in push-on joint pipe shall not be greater than 2/3 of that listed in AWWA C600.

D. Permissible deflection in restrained push-on joint pipe shall be as recommended by the manufacturer.

109.4.4 Setting Valves and Valve Boxes

A. Install valves with operator stems in the vertical plane through the pipe axis and perpendicular to the pipe axis. Locate valves where shown on Drawings. Thoroughly clean valves before installation. Check valves for satisfactory operation before and after installation.

B. Equip all underground valves with valve boxes where shown on the Drawings. Set valve boxes in accordance with Standard Drawings. Set the valve box in alignment with the valve stem centered on the valve nut. Set the valve box to prevent transmitting shock or stress to the valve. Set the box cover flush with the finished ground surface or pavement. PVC extensions shall not be permitted.

109.4.5 Locate Fire Hydrants as shown on Drawings and in accordance with Standard Drawings. The bottom flange of the fire hydrant shall be at finish grade with an acceptable allowance of up to 6” above finish grade.

109.4.6 Provide air and vacuum valves at locations shown on Drawings. Install gate valves between the water main and relief valves. Construct manholes for air and vacuum relief valve as shown on Drawings.

109.4.7 Use sleeves where pipes, valve stem extensions or equipment parts pass through concrete or masonry walls or slabs. Sleeves shall be either cast iron or schedule 40 steel of sufficient size to allow sealing around pipes and clearance for valve stems or equipment. Extend vertical sleeves through slabs 1 inch above top surface.

A. Use cast iron sleeves with intermediate collars to anchor and provide a water stop on outside of sleeves that go through exterior walls below grade.

B. Provide “link-seal" pipe to wall closures manufactured by Thunderline Corp., Wayne, Michigan, or approved equal, where shown on Drawings. Seals shall be modular mechanical type, consisting of interlocking synthetic rubber links shaped to fill annular space between pipe and wall opening to provide water-tight seal between pipe and wall opening.

109.4.8 Provide reaction thrust blocks as shown on typical details

A. Concrete reaction anchors shall bear against undisturbed earth and shall be of the size and shape shown on the typical details.

B. Use metal harness restraints as shown on Drawings.

C. "Mega-Lug" retainer glands may be used on bends of 22 ½ degrees or less in lieu of a concrete thrust block.

D. Where retainer glands are used, extreme care shall be taken so that each set screw is tightened as recommended by the manufacturer before the pipe is backfilled and tested.

109.4.9 When specified, encase water pipelines crossing under highways and railways in a larger pipe or conduit called a casing pipe. Joining of steel casing pipe shall meet requirements of AWWA C206. Install by jacking, boring or open cut if permitted. The carrier pipe shall be supported by full diameter, mechanically adjusted spacers, 8' on center.

The installation shall meet requirements of AREA Standards for installation of pipelines carrying nonflammable substances under railway tracks. Brick up casing pipe ends to protect against foreign matter, but do not tightly seal. Prior to beginning work, notify the Railroad or Street Department.

109.4.10 Installation of Tapping Sleeves and Tapping Valves

A. All tapping sleeves shall be set to avoid interference with existing pipe joints.

B. The contractor shall provide and install the tapping sleeve and valve. Unless otherwise noted the City will make the tap for main lines (no service taps will be made by the City). This service must be scheduled with the Department 48 hours in advance of the tap.

109.4.11 Acceptance Tests

A. When water is available at the site, the owner will supply water at no cost for testing potable water lines only.

B. After the line has been backfilled and at least seven days after the last concrete reaction anchor has been poured, subject the line or any valved section of the line to a hydrostatic pressure test in accordance with AWWA C600, except as modified herein. Fill the system with water at a velocity of approximately 1 foot per second while necessary measures are taken to eliminate all air. After the system has been filled, raise the pressure by pump to 1.5 x the working pressure. Test pressures shall: (1) Not be less than 1.50 x the working pressure at the highest point along the test section, (2) not exceed thrust restraint pressure, (3) not vary by more than + or - 5 psi, (4) not exceed twice the rated pressure of the valves or hydrants when the test includes closed gate valves, (5) not exceed rated pressure of valves if resilient-seated butterfly valves are used, (6) be at least 100 psi. Measure pressure at the low point on the system compensating for gauge elevation. Maintain this pressure for two hours. If the pressure cannot be maintained, determine the cause, make repairs and repeat the test until successful.

C. A leakage test shall be conducted concurrently with the pressure test. Leakage is defined as the quantity of water required to maintain a pressure within 5 psi of the specified test pressure, after air has been expelled and the pipe is filled with water. Leakage shall not exceed 10 gallons per day per mile per inch of diameter. If leakage exceeds that specified, find and repair the leaks, and repeat the test until successful.

D. All visible leaks shall be repaired regardless of the amount of leakage.

109.4.12 Disinfect, flush and test water mains and accessories in accordance with the procedures listed below. The water used in the disinfecting process shall be potable water from an approved supply. If water is to be transported to the subject site, then the tank on the truck must also be properly disinfected prior to transporting water. Disinfection of the vehicle should also include all appurtenances used such as valves, hoses, etc.

A. Preliminary Flushing: The main shall be flushed prior to disinfection, except when the tablet method is used. Flushing shall be at a velocity of not less than 2.5 feet/second. Adequate provisions shall be made for drainage of flushing water.

B. Form of chlorine for Disinfection:

(1) Liquid chlorine shall be used only when suitable equipment is available and only under the direct supervision of a person familiar with the physiological, chemical, physical properties of this element, and who is properly trained and equipped to handle any emergency that may arise. Introduction of chlorine-gas directly from the supply cylinder is unsafe and shall not be permitted.

(2) Calcium hypochlorite contains 70 percent available chlorine by weight. It shall be either granular or in tablet form. The tablets, 6-8 to the ounce, are designed to dissolve slowly in water. A chlorine-water solution shall be prepared by dissolving the granules in water in the proportion requisite for the desired concentration.

(3) Sodium hypochlorite is supplied in strengths from 5.25 to 16 percent available chlorine. The chlorine-water solution shall be prepared by adding hypochlorite to water. Product deterioration shall be reckoned with in computing the quantity of sodium hypochlorite required for the desired concentration.

(4) Application: The hypochlorite solutions shall be applied to the water main with a gasoline or electrically-powered chemical feed pump designed for feeding chlorine solutions. For small applications, the solutions may be fed with a hand pump, for example, a hydraulic test pump. Feed lines shall be of such material and strength as to withstand safely the maximum

pressures that may be created by the pumps. All connections shall be checked for tightness before the hypochlorite solution is applied to the main.

C. Methods of Chlorine Application:

(1) Continuous Feed Method: Water from the existing distribution system or other approved sources of supply shall be made to flow at a constant, measured rate into the newly-laid pipeline. The water shall receive a dose of chlorine, also fed at a constant, measured rate. The two rates shall be proportioned so that the chlorine concentration in the water in the pipe is maintained at a minimum of 50 MG/L available chlorine. To assure that this concentration is maintained, the chlorine residual shall be measured at intervals not exceeding 2,000 feet in accordance with the procedures described in the current edition of "Standard methods" and AWWA M12-"simplified procedures for water examination." In the absence of a meter, the rate may be determined either by placing a pilot gauge at the discharge or by measuring the time to fill a container of known volume. Table 1 gives the time to fill a container of known volume, and gives the amount of chlorine required for each 100 feet of pipe of various diameters. Solutions of 1 percent chlorine may be prepared with sodium hypochlorite or calcium hypochlorite. The latter solution requires approximately 1 lb. of calcium hypochlorite in 8.5 gallons of water.

TABLE 1
CHLORINE REQUIRED TO PRODUCE 50 MG/L CONCENTRATION
IN 100 FT. OF PIPE - BY DIAMETER

100 PERCENT		1 PERCENT
PIPE SIZE	CHLORINE	CHLORINE SOLUTIONS
IN.	LB.	GAL.
4	0.027	0.33
6	0.061	0.73
8	0.108	1.30
10	0.170	2.04
12	0.240	2.88
16	0.430	5.12
20	0.675	8.00

During the application of the Chlorine, valves shall be manipulated to prevent the treatment dosage from flowing back into the line supplying the water. The chlorine application shall not cease until the entire main is filled with the chlorine solution. The chlorinated water shall be retained in the main for at least 24 hours, during which time all valves and hydrants in the section treated shall be operated in order to disinfect the appurtenances. At the end of this 24

hour period, the treated water shall contain no less than 25 MG/L chlorine throughout the length of the main.

(2) Slug Method (use only if authorized by the Utilities Department): Water from the existing distribution system or other approved source of supply shall be made to flow at a constant, measured rate into the newly laid pipeline. The water shall receive a dose of chlorine, also fed at a constant, measured rate. The two rates shall be proportioned so that the concentration in the water entering the pipeline is maintained at no less than 300 MG/L. The chlorine shall be applied continuously and for a sufficient period to develop a solid column or "slug" of chlorinated water that will, as it passes along the line, expose all interior surfaces to a concentration of at least 300 MG/L for at least 3 hours. The application shall be checked at a tap near the upstream end on the line by chlorine residual measurements.

As the chlorinated water flows past tees and crosses, related valves and hydrants shall be operated so as to disinfect appurtenances.

(3) Tablet Method: Use only when scrupulous cleanliness has been exercised, because preliminary flushing cannot be used. Do not use this method if trench water or foreign material has entered the main or if the water is below 41 deg. F (5 deg. C). This method may be used for mains up to 12 inches in diameter and where the total length of the main is less than 2,500 feet. Tablets shall not be used with PVC pipe.

Place tablets in each section of pipe and also in hydrants, hydrant branches, and other appurtenances. Attach tablets using Permatex No. 1 adhesive or other adhesive approved by the engineer, except for the tablets placed in hydrants and in the joints between the pipe sections. Tablets shall be free of adhesive except on the one broad side to be attached. Place all tablets at the top of the main. If the tablets are attached before the pipe section is placed in the trench, mark the position of the tablet in the pipe and assure that the pipe is placed with the tablet at the top.

The following table shows the number of 5 grain HTH tablets necessary per joint of pipe to obtain 50 PPM chlorine:

PIPE SIZE	TABLETS PER 18-20 FEET JOINT
3 IN	1
4 IN	1
6 IN	2
8 IN	3
10 IN	4
12 IN	7

When installation is completed, fill the main with water at a velocity of less than 1 foot per second. The water shall remain in the pipe for at least 24 hours. Operate valves so that the strong chlorine solution will not flow back into the line supplying the water.

D. Final Flushing: After the applicable retention period, the heavily chlorinated water shall be flushed from the main until the chlorine concentration is no higher than that generally prevailing in the system, or less than 1 MG/L. Chlorine residual investigation shall be made to ascertain that the heavily chlorinated water has been removed from the pipeline. Flushing shall be through a fire hydrant. When a fire hydrant is not available for complete flushing, it shall be through a minimum 2" tap to ensure removal of any debris in the pipe.

E. Bacteriologic Tests:

(1) After final flushing, and before the water main is placed in service, samples shall be collected and tested for bacteriological quality and shall show the absence of coliform organisms. At least two samples shall be collected at least 24 hours apart at intervals not exceeding 2,000 feet and tested by a State Health Department approved laboratory and the results shall be submitted to the engineer.

(2) Samples for bacteriological analysis shall be collected in sterile bottles treated with sodium thiosulfate. If laboratory results indicate the presence of coliform bacteria, the samples are unsatisfactory and disinfection shall be repeated until the samples are satisfactory. Cleaning, disinfection and testing shall be the responsibility of the contractor. Water for these operations will be furnished by the owner, but the contractor shall include in his bid the cost of loading, hauling, and discharging the water.

(3) A sampling tap consisting of a corporation cock with metal pipe shall be installed within two feet of valves. The corporation stop inlet shall be male, one inch in size, and the outlet shall have one inch I.P. threads and a cap.

F. Testing and disinfection of the completed sections shall not relieve the contractor of his responsibility to repair or replace any cracked or defective pipe. All work necessary to secure a tight line shall be at the contractor's expense.

109.4.13 Measurement and Payment

A. Waterline - Measurement shall be parallel to the pipe including the length occupied by appurtenances. Bid price shall include all excavation bedding and backfill. Payment shall be per linear foot for the size and type specified.

B. Valves - Measurement shall be per each installed. The bid price shall include all incidental materials, including the valve box. Payment shall be per each for the size and type specified.

C. Bends, Plugs, and Reducers - Measurement for ductile iron fittings shall be based on the weight of the fitting only (no miscellaneous hardware). Payment shall be at the bid price per pound. The price shall include all incidental work and thrust blocks.

D. Tees and Crosses - Measurement and payment shall be per each for the size specified. All incidental materials and work shall be included.

E. Tapping Sleeve and Valve – Measurement and payment shall be per each For the size specified. All incidental materials and work shall be included.

F. Fire Hydrant - Measurement and payment shall be per each. The cost of fire hydrant extensions is to be included in the bid price. All other incidental materials and workmanship shall be included. The cost of valves, tees, and water line shall be paid for separately.

G. Service Line - Measurement will be per lineal foot of line installed including all associated work. Payment will be the bid price per lineal foot installed for the size indicated.

H. Air Release Valve - Measurement and payment shall be per each including all incidental materials and workmanship. The bid price shall also include the valve vault. Service line shall be paid for separately.

I. Service Connections - Measurement will be per each type connection made including all miscellaneous materials and associated work. Payment shall be the bid price per each for the appropriate type. Service line shall be paid for separately.

J. Existing Line Abandonment - When specified as a separate item on the Bid Schedule, payment shall be lump sum for all efforts and material to locate the existing line and performing the directed abandonment. Line abandonment shall be identified as being valve closure or remove and splice.

K. Connection to existing water system – Measurement and payment shall be per each with no regard to size. This work involves connecting the new water system with the existing water lines after line testing and acceptance. Separate payment will be made for all related pay items such as pipe, bends, valves, etc. This pay item is separate from a main line wet tap.

L. Blow Off – Measurement and payment shall be per each and shall include the tee, valve, and pipe, blow off and box.

M. Check Valve – Measurement and payment shall be per each and include installation of the check valve and vault.

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N. Concrete Restoration - All concrete sidewalk, curb and gutter disturbed during construction, shall be replaced at the Contractor's expense. Full sections will be replaced. Payment is incidental unless a separate pay item is listed.

SECTION 110 - CURB & GUTTER, SIDEWALK, MISCELLANEOUS CONCRETE

110.1 GENERAL

Work included in this Section consists of all new and/or replacement/repair of curb and gutter, curb, sidewalk and other miscellaneous concrete work.

110.1.1 Referenced Specification by Abbreviation:

Virginia Department of Transportation-(VDOT)

110.1.2 All materials and workmanship associated with this Section will be in accordance with VDOT's Road and Bridge Standards and Specifications unless otherwise noted.

110.2 PRODUCTS

A. Submit shop drawings of all products as by the City.

B. Provide Certified test results and/or mix designs.

110.2.1 Concrete shall be VDOT A-3 unless otherwise noted.

110.2.2 Base aggregate shall be VDOT 21A unless otherwise noted.

110.2.3 Brick pavers shall be standard 4" x 8" x 2-3/8" Pine Hall Pathway or Lawrenceville I-875.

110.2.4 Concrete pavers shall be 4”x 8” Holland Stone Interlocking Paving System.

110.3 EXECUTION

110.3.1 Regular excavation shall include removal and disposal of all existing concrete and asphalt, existing steps as required, as well as earth and all other materials associated with normal excavation to a depth to allow for the installation of the proposed project. All bituminous concrete paved surface immediately adjacent to the excavated areas must be saw cut in a straight line so that when excavation procedures are performed, existing paved surfaces will not be damaged. All concrete surfaces adjacent to the proposed project shall be saw cut in a neat straight line.

All areas beneath the proposed construction shall be excavated and/or graded to a smooth uniform surface and compacted prior to installation procedures. All excavation shall be disposed off the project by the Contractor. All excavation shall be considered incidental to the contract.

Unstable Subgrades and Fill - Concrete shall be placed on the earth subgrade if the said subgrade is stable. In unstable areas, the subgrade shall be undercut and replaced with approved material to provide a sound subbase. All

fill material required on this project shall be VDOT 21-A compacted to 95% modified proctor density.

110.3.2 Formwork shall be in accordance with VDOT Road and Bridge Specifications.

110.3.3 Protection and Curing shall be in accordance with VDOT Road and Bridge Specifications. Curing compound shall be white.

110.3.4 Sidewalks shall be the combination curb and walk type as shown on the detail drawing. Brick veneer sidewalks are to be constructed at locations designated by the Owner.

110.3.5 Sidewalks are to be installed so that the back of the walk is on the street right-of-way line, or as directed by the Owner.

110.3.6 All sidewalk slabs shall receive a steel trowel float and broom finish and all curbs shall receive a broom finish.

110.3.7 All concrete sidewalks shall receive a score line in finished surface every five feet (5'). Depth of the score line shall be a minimum of 5/8".

110.3.8 Expansion material shall be installed every 40' in sidewalks and between all existing and proposed concrete surfaces. Along areas where the new walk abuts against an existing uneven retaining wall expansion material shall be installed 4.5' behind and parallel to the face of curb or as directed by the Owner. Concrete shall then be poured behind the expansion material to fill the void area between the face of the walls and expansion. This is done to allow the expansion material to be installed in a smooth straight line. Expansion material shall be of a type equal to the asphalt impregnated fiberboard conforming to ASTM c 175 for exterior work. Expansion material shall extend full depth of slab, less 1/2" at top of slab.

110.3.9 After front forms have been removed along the edge of pavement, the contractor shall rub the face of newly installed curb to fill any voids and remove rough spots from the face of curb. In addition, the contractor shall place 21-A Aggregate in the void area between the face of curb and the edge of pavement to an elevation which will match the grade of the existing pavement.

110.3.10 All curb and gutter shall be CG-6 or “roll-top” when specified.

110.3.11 All curb shall be CG-2.

110.3.12 Expansion material shall be installed every 100' in curb and gutter. Expansion material shall be of a type equal to the asphalt impregnated fiberboard conforming to ASTM C 175 for exterior work. Expansion material shall extend full depth of curb and gutter, less 1/2" at top of concrete.

110.3.13 All properties which have existing entrance ways shall have new entrances installed at their present location. Entrances will vary in width depending upon field conditions but the standard width shall be 12’ at the back. On all existing

concrete driveways, the contractor shall tie the driveway into the back of the new entrance using concrete to provide a smooth ride across the entrance onto the existing driveway. The contractor shall perform all asphalt driveway connections to the back of the new entrance. The contractor will be required to place stone behind the new entrance for all driveway connections, both concrete and asphalt, as a temporary measure to allow for the use of the entrance prior to its final completion. The exact number of entrances may vary from those shown on the proposal. Entrances may be added or deleted from those anticipated thus affecting the quantities for both entrances, sidewalks, and curb and gutter. The contractor shall schedule entrance construction to inconvenience property owners no more than necessary.

110.3.14 All existing walks and steps that serve private residences, businesses, etc., shall be tied to the back of the newly installed sidewalk. In performing this portion of the work, the Contractor will encounter a multiple of different situations due to grade problems, height and number of steps, etc. For bidding purposes, the contractor shall base his bid on the following breakdown:

A. All existing sidewalk connections which are tied flush to the newly installed sidewalk shall be paid as miscellaneous concrete installation. Payment shall be based on field measurements.

B. All steps constructed to facilitate a connection to back of the new sidewalk shall be paid for on a per each basis. Steps for this project shall be defined as any step with a minimum rise of 4", a maximum width of 5' and a maximum tread of 2'. A change in elevation from the new sidewalk to an existing walk or step is not considered a step for payment purposes. All steps shall be constructed using the same type material as that of the existing walk. If no walk exists, steps shall be constructed using concrete.

110.3.15 All yard areas immediately behind newly installed sidewalks shall be topsoiled and seeded so as to provide a smooth tie in with the existing yard and back of the walk.

110.3.16 Brick sidewalks are to be installed per the Standard Drawing. Base stone shall be VDOT 21A.

The bricks shall be set in a minimum 1/2" mixture of dry 1 part cement and 3 parts sand. Sand shall be swept between the brick joints. Brick pavers shall have a smooth surface that is flush with the curbing.

110.3.17 Detectable warning surface shall be constructed at each street intersection and/or as directed by the City. They shall be VDOT standard CG-12.

110.3.18 Existing limestone curb is to be adjusted for a straight alignment and raised to provide a 6" curb height. Thoroughly compact 21-A aggregate under all disturbed limestone curb.

110.3.19 When an entrance is required across a brick sidewalk, it shall be a haringbone design. The standard concrete entrance shall be modified to leave a depth equal in thickness to the brick paver and mortar bedding with a 4" wide lip on the back. The brick pavers shall tie in flush with the front curb, back lip and adjacent sidewalk.

110.3.20 The Contractor shall be responsible for both the adjustment and relocation of water meter boxes. Adjustment means the vertical and/or minimal horizontal adjustment of the meter box only. Relocated water meters will be any meter that will require cutting into the existing service lines. The City will provide the yoke assembly and box for relocations.

110.4 MEASUREMENT AND PAYMENT

110.4.1 Sidewalk - Measurement shall be the horizontal surface area (including curb on monolithic curb and sidewalk) of sidewalk. Work is to include excavation, backfill, and materials, etc. Payment shall be at the bid price per square yard.

110.4.2 Curb and Gutter - Measurement shall be parallel to the curb and gutter excluding entrances. There shall be no separation between straight and radial curb and gutter. Work is to include all excavation, backfill, and materials. Payment shall be at the bid price per linear foot.

110.4.3 Curb - Measurement includes entrances. There shall be no separation between straight and radial curb. Work is to include all excavation, backfill, and materials. Payment shall be at the bid price per linear foot.

110.4.4 Sidewalk Entrance - Measurement shall be the horizontal area (including curb on monolithic curb and sidewalk) of entrance. Work is to include all excavation, backfill and materials. Payment shall be the bid price per square yard.

110.4.5 Curb and Gutter Entrance - Measurement shall be parallel to the curb and gutter entrances. There shall be no separation between straight and radial curb and gutter entrances. Work is to include all excavation, backfill, and materials. Payment shall be at the bid price per linear foot.

110.4.6 Brick Sidewalk - Measurement shall be the horizontal surface of brick sidewalk. Work is to include all excavation, backfill and materials. Payment shall be the bid price per square yard.

110.4.7 Detectable Warning Surface - Measurement shall be per each in addition to payment for sidewalk. Payment shall be the bid price per each.

110.4.8 Steps - Measurement shall be per each 5' in width. Steps created by increasing the height of the sidewalk are not a pay item. Work is to include excavation, backfill, and all associated for concrete steps. Payment shall be per the bid price for each concrete step constructed.

110.4.9 Miscellaneous Concrete - Measurement shall be the horizontal surface area of concrete adjacent to the street sidewalk (private, walks, driveways, etc.) Work includes all excavation backfill, work and materials required. Payment shall be the bid price per square yard of miscellaneous concrete installed.

110.4.10 Stone Base - Measurement shall be by the ton of base stone placed under sidewalk, curb and gutter, gutter, miscellaneous concrete and street patch. Work is to include all excavation and incidental work. Payment shall be the bid price per ton.

110.4.11 Saw Cut - Measurement shall be parallel to the saw cut. Payment is for concrete saw cuts only as directed by the City and when identified as a separate pay item. Payment will be the bid price per linear foot.

110.4.12 Stone Curb - Measurement shall be per linear foot measured parallel to the sidewalk. Payment shall be the bid price per linear foot only for those curbs adjusted.

110.4.13 Concrete Entrance with Brick veneer - Measurement shall be the horizontal surface of brick veneer entrance. Payment shall be the bid price per square yard and shall include all excavation, backfill, concrete entrance and brick veneer. There shall be separate payment for linear footage of curb across the entrance. There shall be no separate payment for concrete entrance.

SECTION 111 - STREET CONSTRUCTION AND REPAIR/PATCHING

111.1 GENERAL

Work covered by this section includes all work associated with construction of a new street and the repair or patching of an existing street.

111.1.1 Referenced Specifications by Abbreviation:

Virginia Department of Transportation - (VDOT)

111.1.2 All materials and workmanship associated with this Section shall be in accordance with VDOT's Road and Bridge Standards and Specifications unless otherwise noted.

111.2 PRODUCTS

A. Submit shop drawings of all products as by the City.

B. Provide Certified test results and/or mix designs.

111.2.1 All materials shall meet the specifications of VDOT's Road and Bridge Specifications.

111.3 EXECUTION

111.3.1 All excavation, backfill, base stone, and plant mix for new streets shall be constructed in accordance with VDOT's Road and Bridge Specifications.

111.3.2 The typical street section shall be as shown on the plans.

111.3.3 The street shall be graded to the right-of-way line before beginning cut and fill slopes. Protection and Curing shall be in accordance with VDOT Road and Bridge Specifications.

111.3.4 Street repair/patching shall be in accordance with the Standard Drawing or Plans.

111.3.5 Make a neat saw cut on all sides of a street repair/patch. Square up all patches.

111.3.6 Maintain all street excavations to a smooth transition until final street repair/patch is complete.

111.3.7 A temporary repair/patch of prime and double seal is permitted when plant mix is not available.

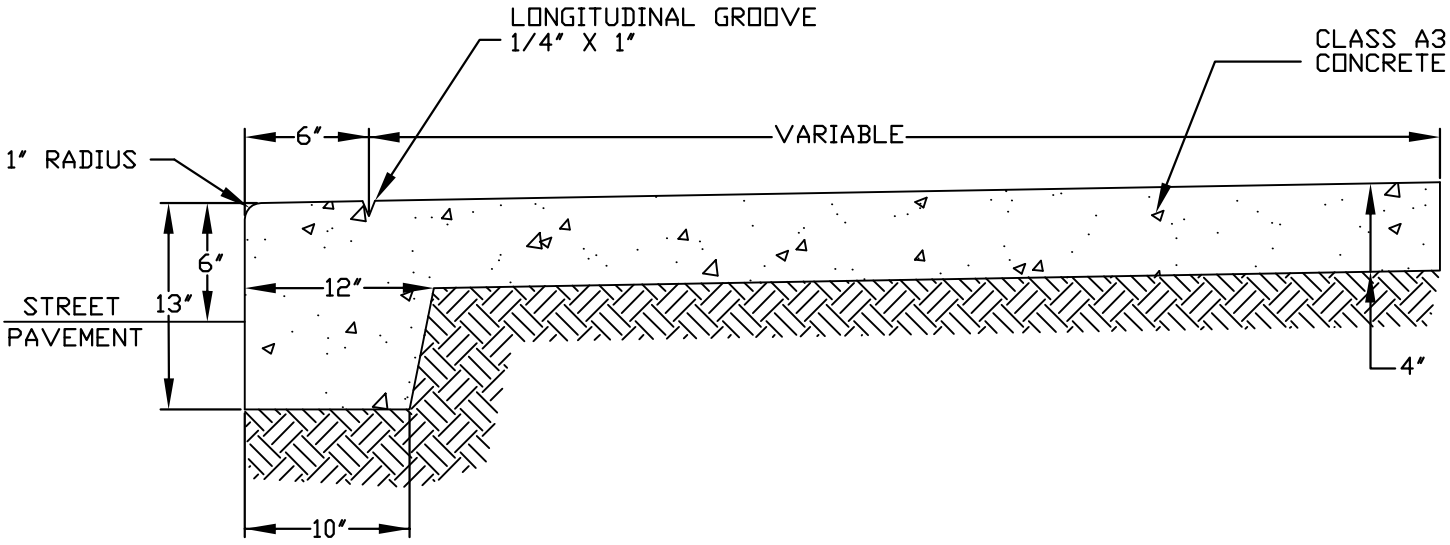
111.4 MEASUREMENT AND PAYMENT

111.4.1 Excavation and Fill for new streets shall be in accordance with VDOT Standards.

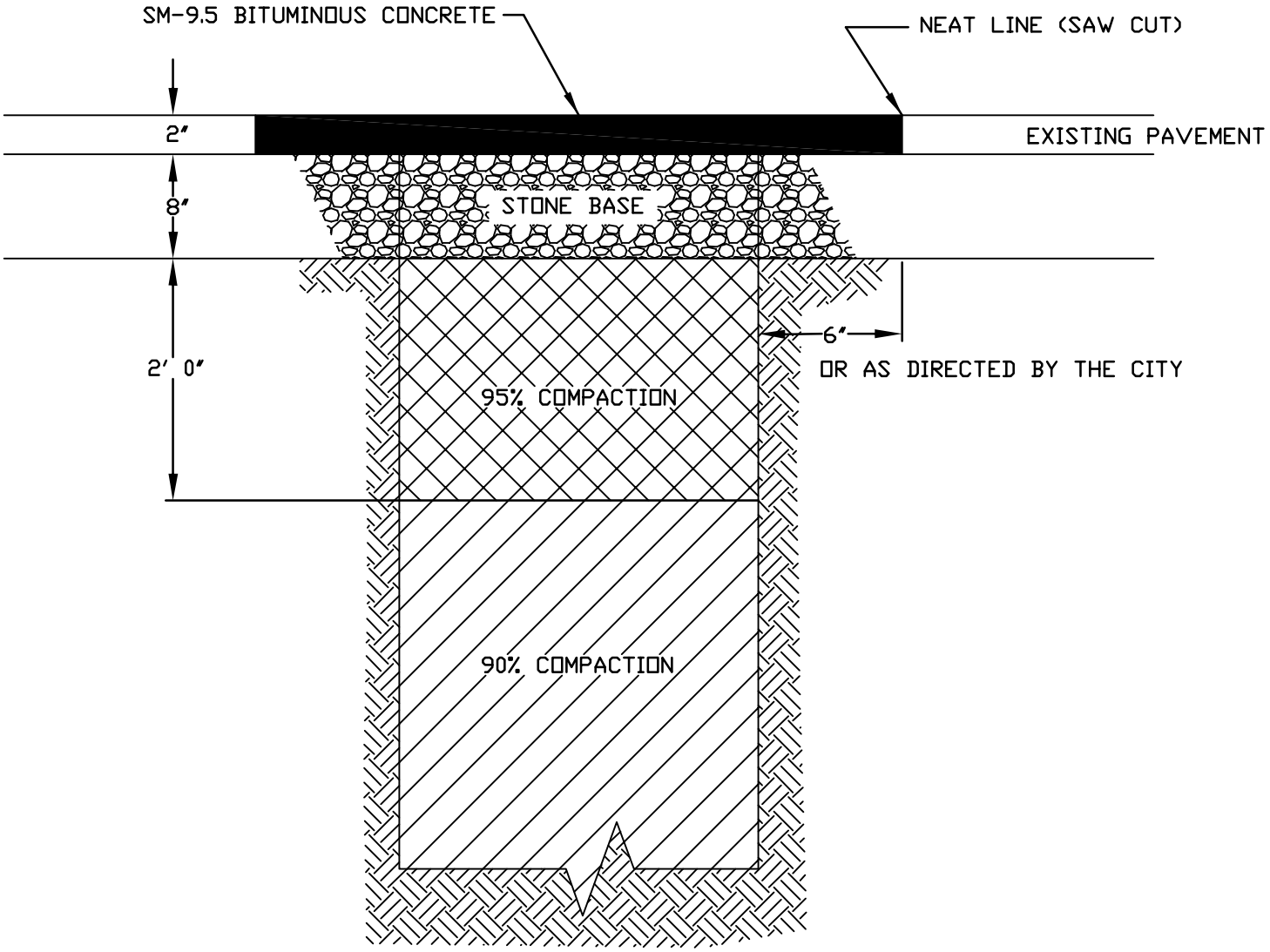
111.4.2 Base Stone for new streets shall be in accordance with VDOT Standards.

111.4.3 Bituminous Concrete for new streets shall be in accordance with VDOT Standards.

111.4.4 Street Repair/Patch - Measurement shall be for the horizontal area of pavement not exceeding the pay limits. Work is to include all excavation, saw cut, stone base, and bituminous concrete required to complete the repair/patch. Payment shall be the bid price per square yard. There are no separate payments for stone, bituminous concrete or saw cut.



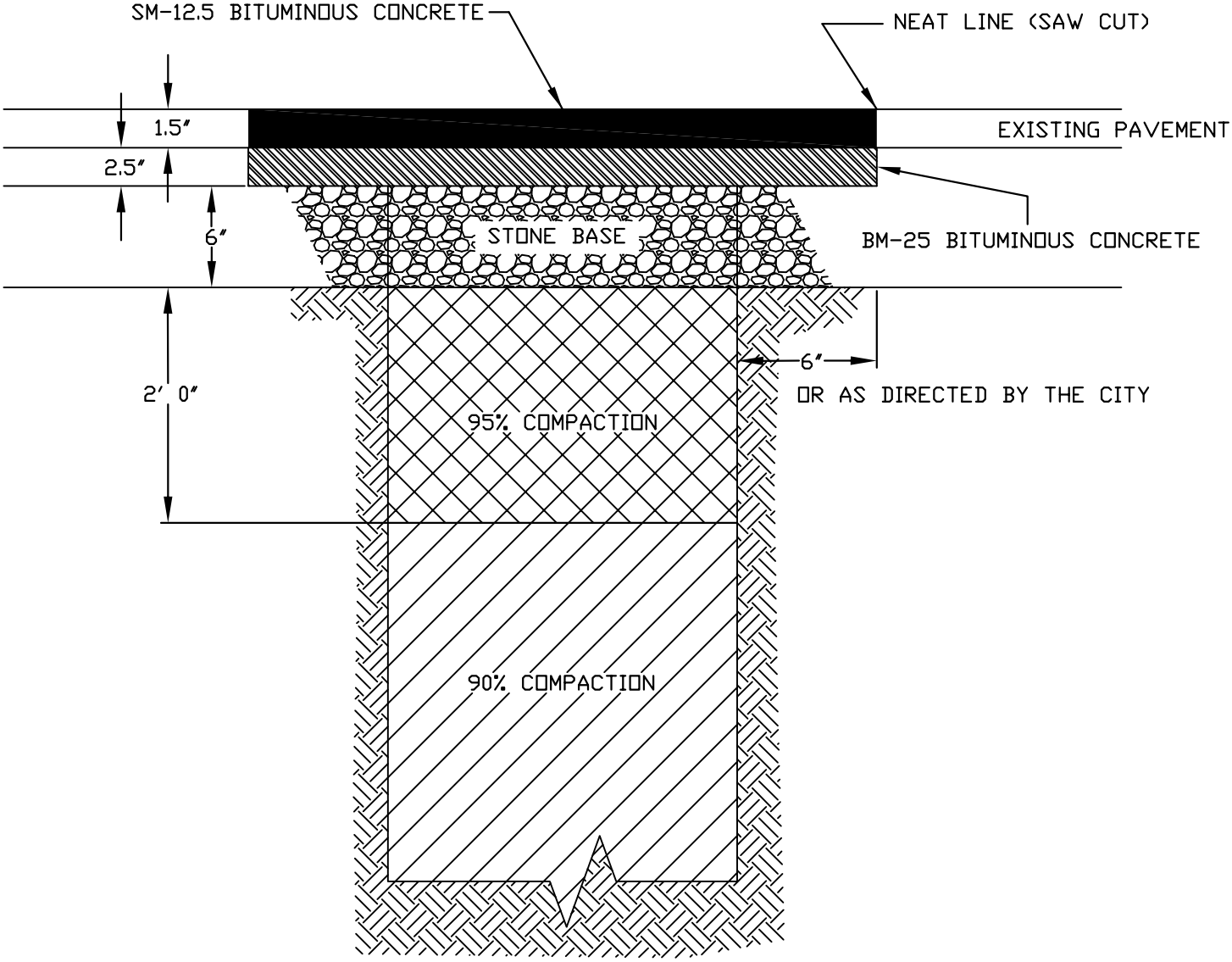
CITY OF STAUNTON, VA	**MONOLITHIC CONCRETE WALK**	Draw No. **M-1**



NOTE:

1. COMPLETED PATCH TO BE FLUSH WITH EXISTING PAVEMENT

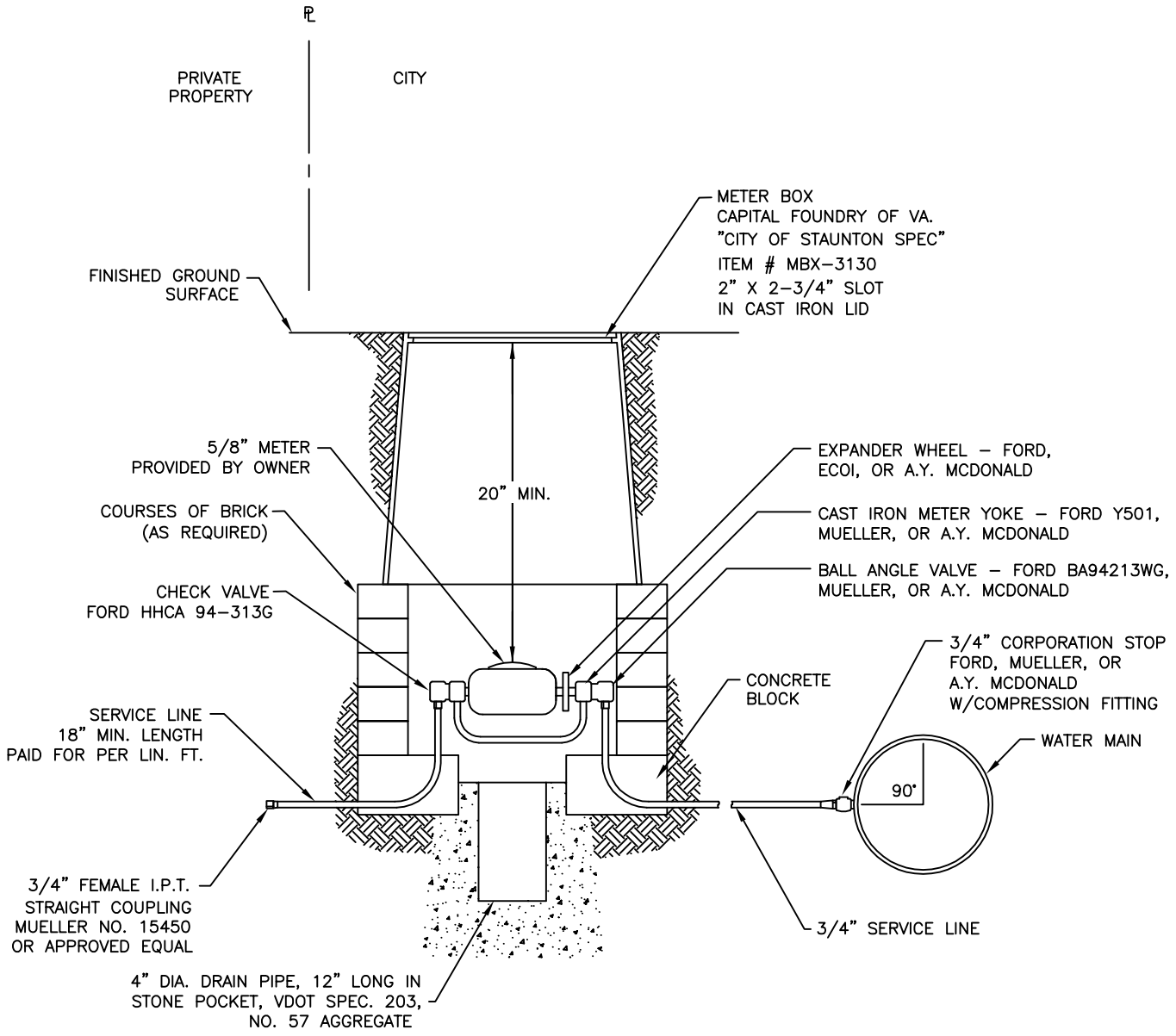
CITY OF STAUNTON, VA	**STANDARD PATCH FOR ASPHALT PAVEMENT**	Draw No. **M-5**



NOTE:

1. COMPLETED PATCH TO BE FLUSH WITH EXISTING PAVEMENT

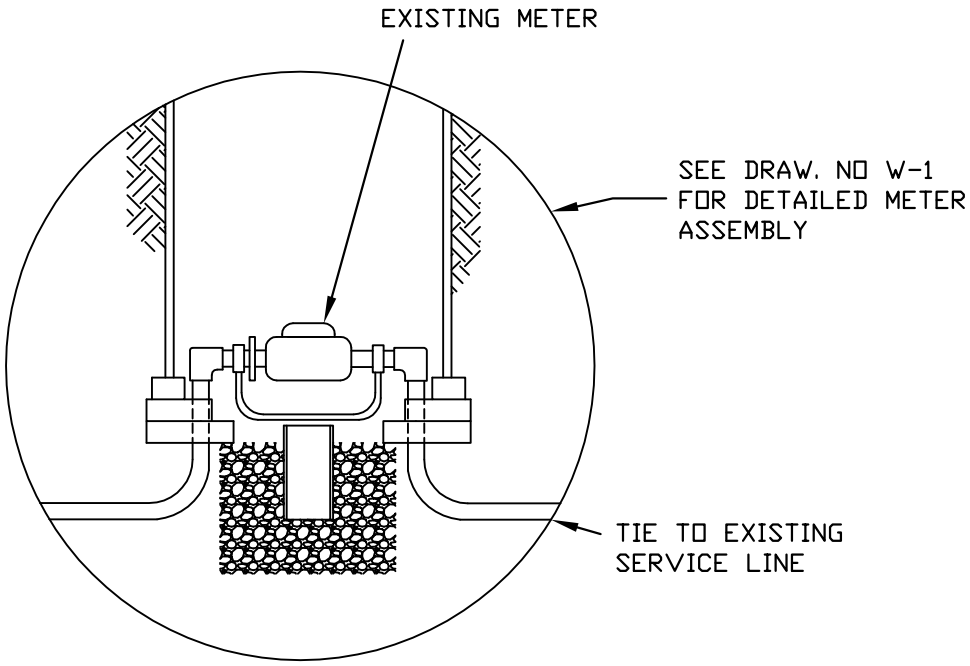
CITY OF STAUNTON, VA	**HEAVY DUTY PATCH FOR ASPHALT PAVEMENT**	Draw No. **M-5(H)**



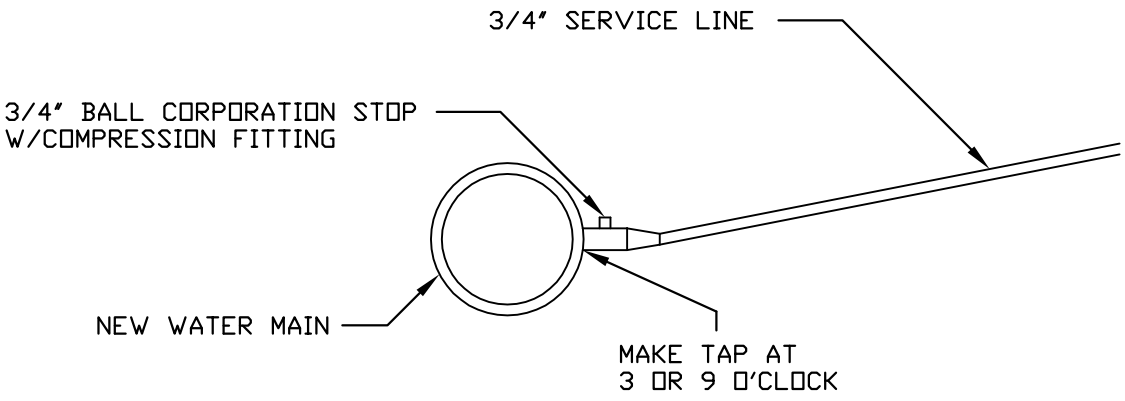
ALL COPPER CONNECTIONS AND FITTINGS SHALL BE COMPRESSION

Rev. 8-23-2018

CITY OF STAUNTON, VA	**TYPICAL WATER SERVICE CONNECTION UP TO 1"**	Draw No. **W-1**

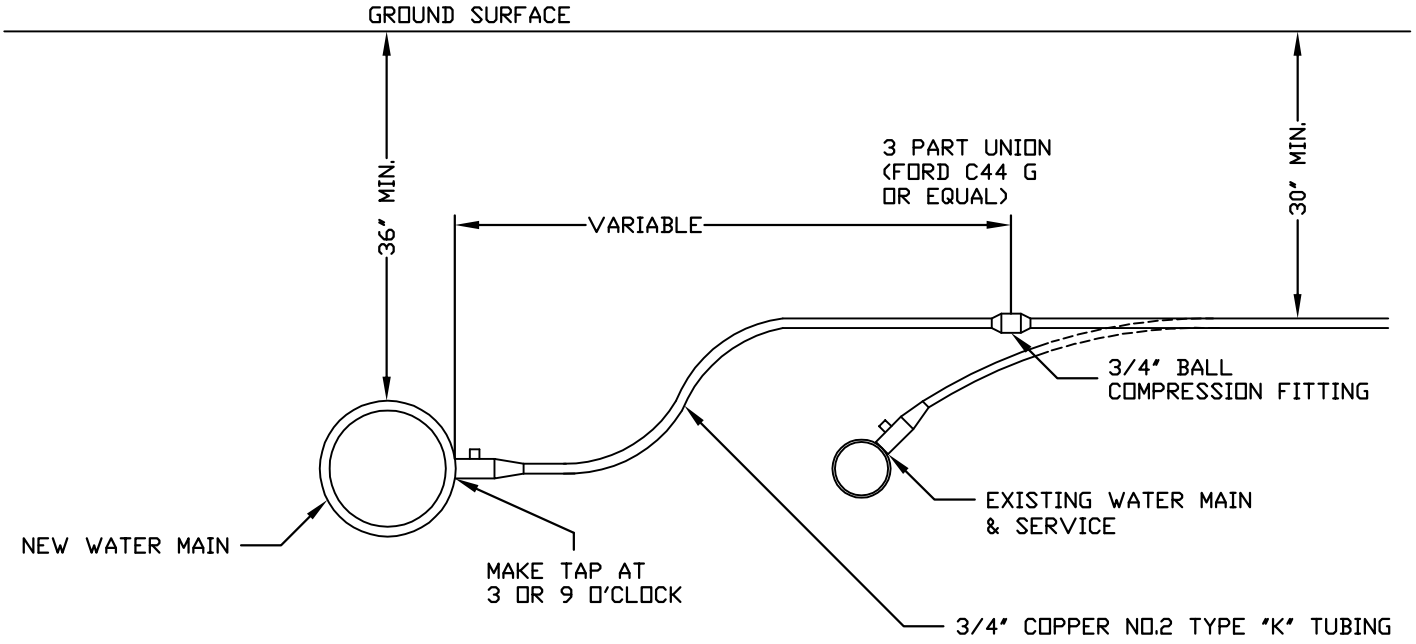


REPLACE EXISTING YOKE ASSEMBLY & BOX
(FURNISHED BY CITY)

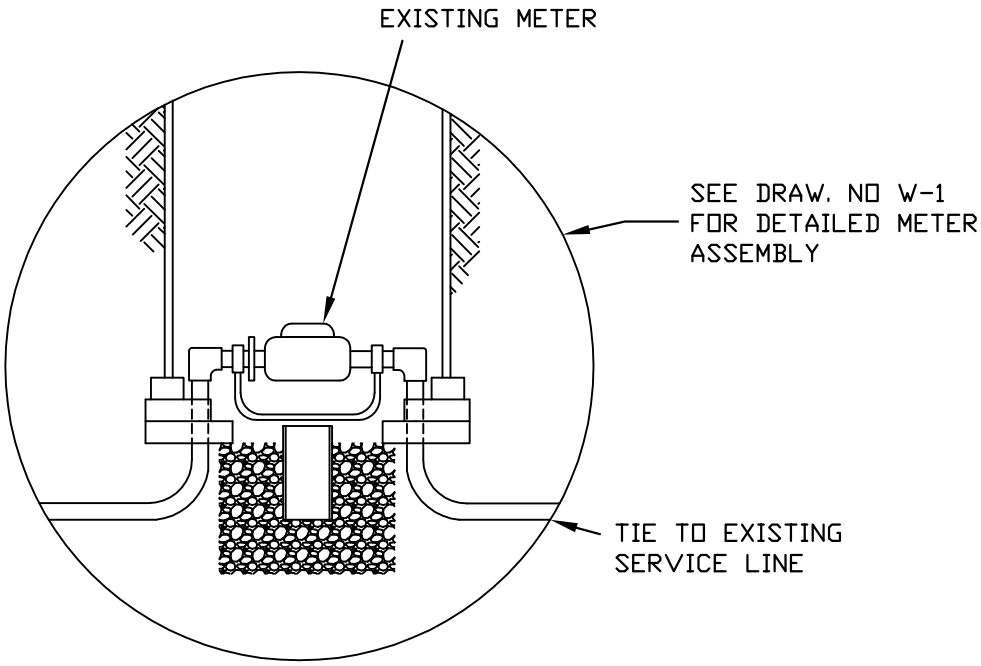


Rev. 7-2-2018

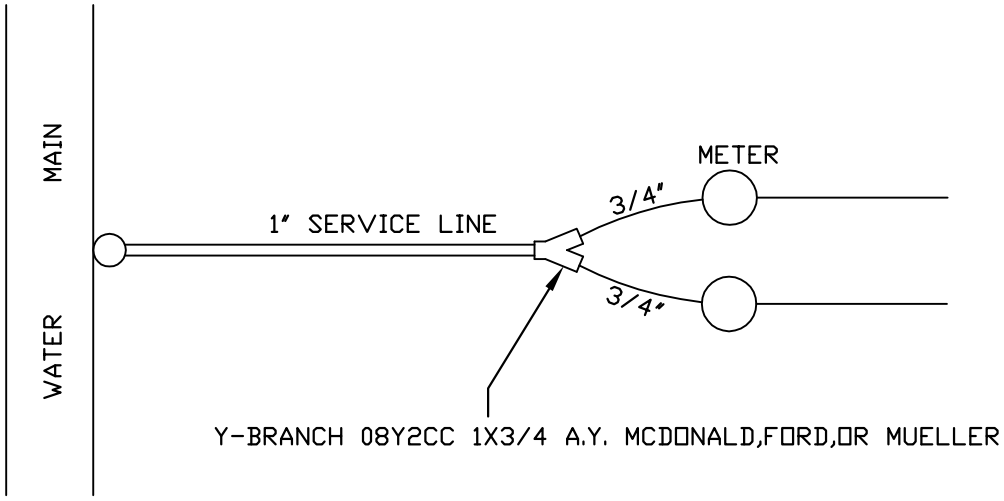
CITY OF STAUNTON, VA	**TYPE I SERVICE CONNECTION**	Draw No. **W-7**

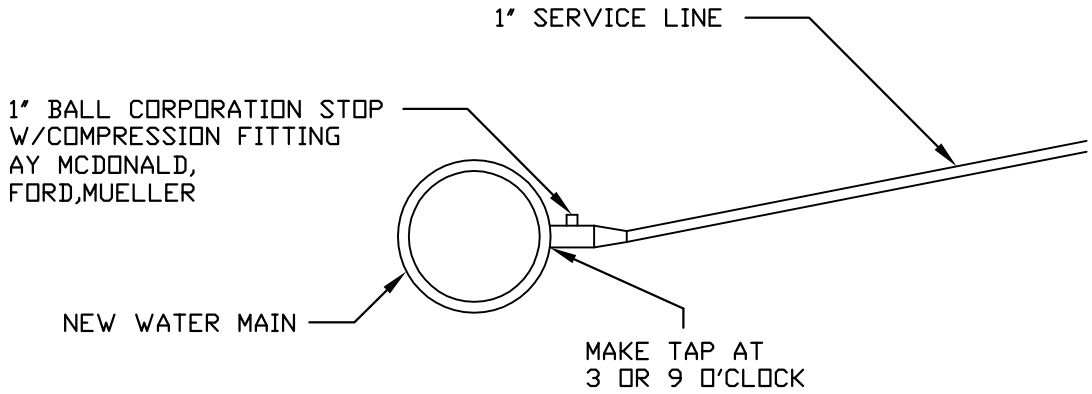


CITY OF STAUNTON, VA	**TYPE II SERVICE CONNECTION**	Draw No. **W-8**



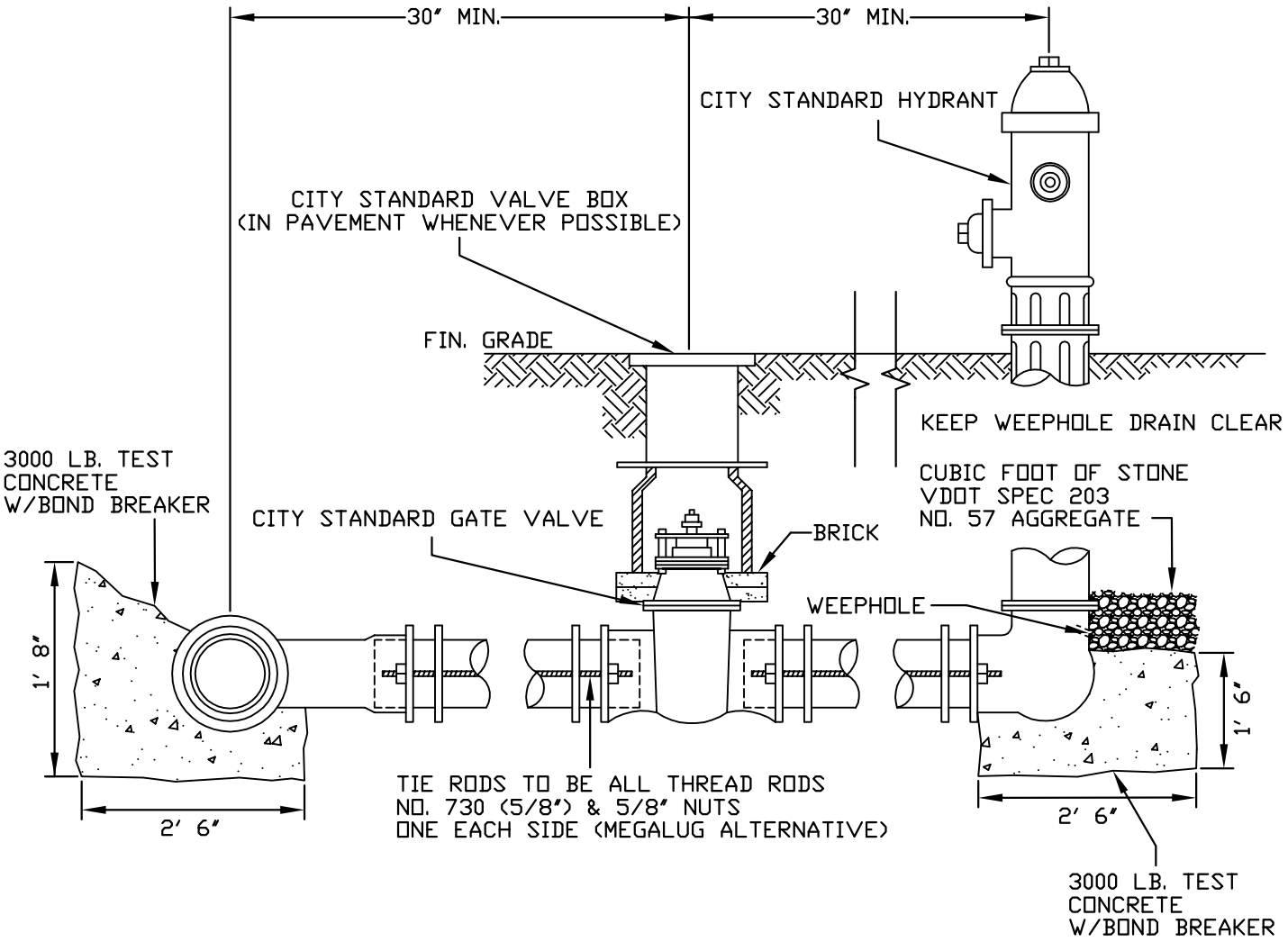
REPLACE EXISTING YOKE ASSEMBLY & BOX
(FURNISHED BY CITY)





Rev. 7-2-2018

CITY OF STAUNTON, VA	**TYPE III SERVICE CONNECTION**	Draw No. **W-9**

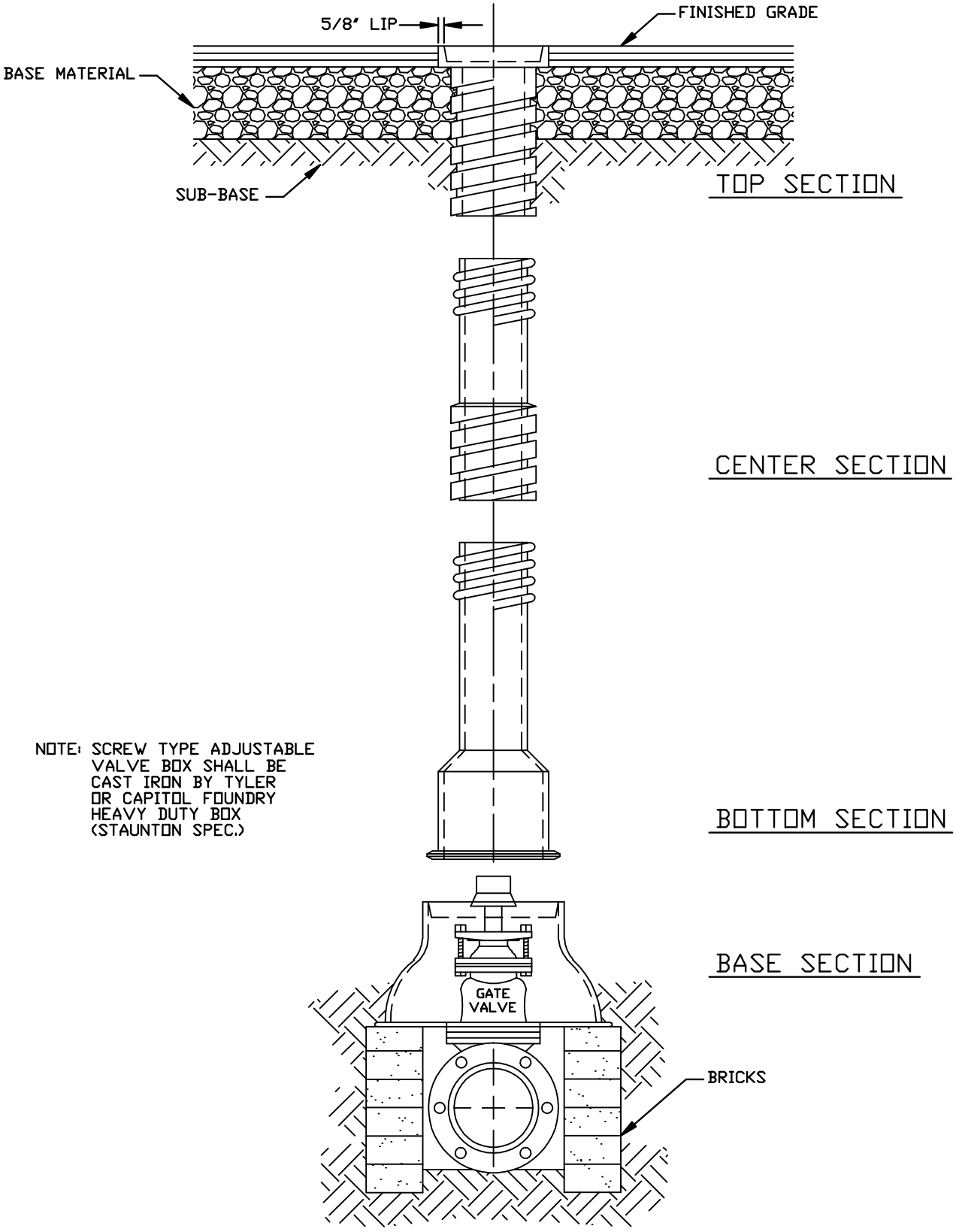


NOTES:

LOCATE VALVE IN PAVEMENT WHERE APPLICABLE

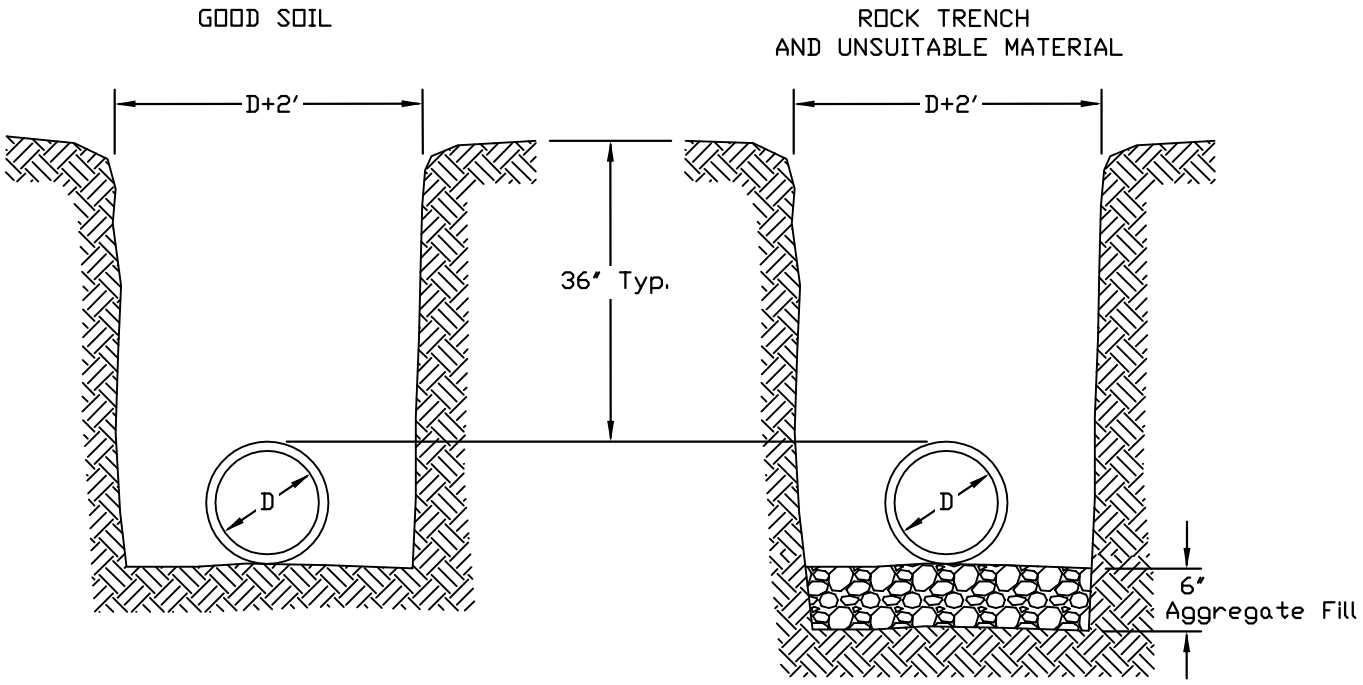
WEEP HOLES SHALL BE LOCATED ABOVE THE SEASONAL WATER TABLE

CITY OF STAUNTON, VA	**STANDARD FIRE HYDRANT ASSEMBLY**	Draw No. **W-10**



NOTE: SCREW TYPE ADJUSTABLE VALVE BOX SHALL BE CAST IRON BY TYLER OR CAPITOL FOUNDRY HEAVY DUTY BOX (STAUNTON SPEC.)

CITY OF STAUNTON, VA	**SCREW - TYPE ADJUSTABLE VALVE BOX**	Draw No. **W-11**

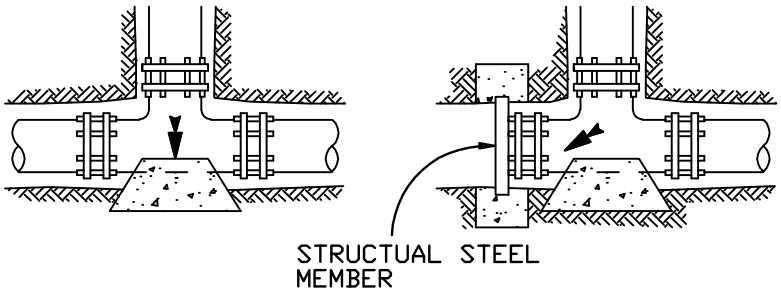


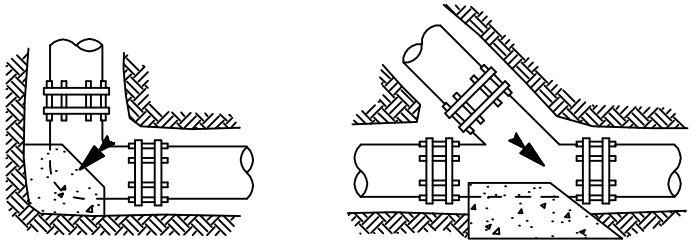
NOTE:
1. ALL BEDDING SHALL BE CONTINUOUS AND UNIFORM

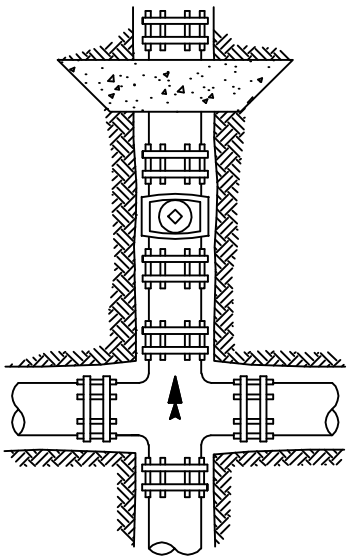
2. EXCAVATION IS REQUIRED TO ENSURE THERE IS NO ROCK WITHIN 6" OF THE BOTTOM OF THE PIPE

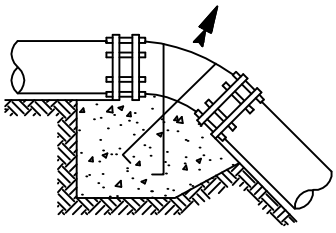
CITY OF STAUNTON, VA	**WATER PIPE INSTALLATION**	Draw No. **W-12**

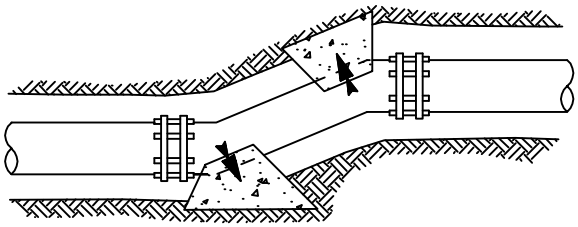
XXV











ARROW INDICATES
THE DIRECTION OF THE
RESULTANT THRUST FORCE

XXIV

UTILIZE: TO DETERMINE THE THRUST
TO BE RESTRAINED BY A THRUST BLOCK

RESULTANT THRUST AT FITTINGS AT 100 PSI WATER PRESSURE

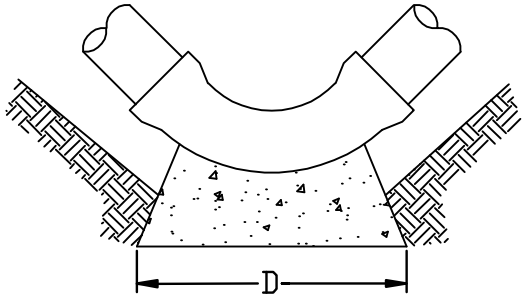
NOM. PIPE DIA. IN.	TOTAL POUNDS DEAD END	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND
4	1,810	2,559	1,385	706	355
6	3,739	5,288	2,862	1,459	733
8	6,433	9,097	4,923	2,510	1,261
10	9,677	13,685	7,406	3,776	1,897
12	13,685	19,353	10,474	5,340	2,683
14	18,385	26,001	14,072	7,174	3,604
16	23,779	33,628	18,199	9,278	4,661
18	29,865	42,235	22,858	11,653	5,855
20	36,644	51,822	28,046	14,298	7,183
24	52,279	73,934	40,013	20,398	10,249
30	80,425	113,738	61,554	31,380	15,766
36	115,209	162,931	88,177	44,952	22,585
42	155,528	219,950	119,036	60,684	30,489
48	202,683	286,637	155,127	79,083	39,733
54	256,072	362,140	195,989	99,914	50,199

TO DETERMINE THRUST AT PRESSURES OTHER THAN 100 PSI, MULTIPLY THE THRUST OBTAINED IN THE TABLE BY THE RATIO OF THE PRESSURE TO 100

FOR EXAMPLE, THE THRUST ON A 12 INCH, 90° BEND AT 125 PSI IS 19,353 X $\frac{125}{100}$ = 24,191 POUNDS

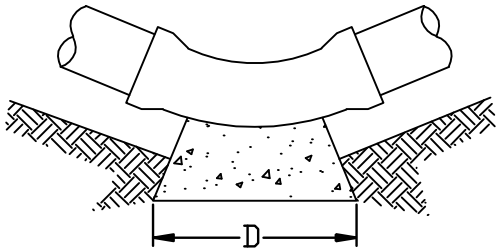
CITY OF STAUNTON, VA	THRUST BLOCK TABLES XXV,XXIV	Draw No. W-13

90° BEND PLAN



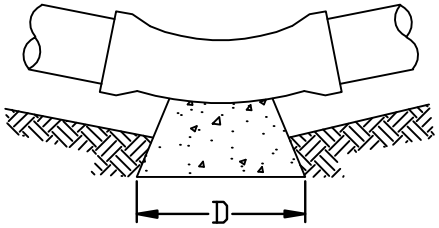
D = 3′ 6″ FOR 4″ PIPE
D = 4′ 0″ FOR 6″ PIPE
D = 4′ 6″ FOR 8″ PIPE
D = 5′ 0″ FOR 10″ PIPE

45° BEND PLAN



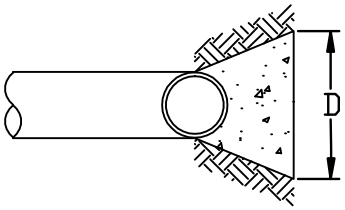
D = 1′ 8″ FOR 4″ PIPE
D = 2′ 4″ FOR 6″ PIPE
D = 3′ 0″ FOR 8″ PIPE
D = 3′ 6″ FOR 10″ PIPE

22 1/2° BEND PLAN



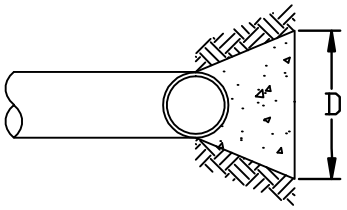
D = 1′ 8″ FOR 4″ PIPE
D = 2′ 0″ FOR 6″ PIPE
D = 2′ 10″ FOR 8″ PIPE
D = 3′ 6″ FOR 10″ PIPE

SECTION



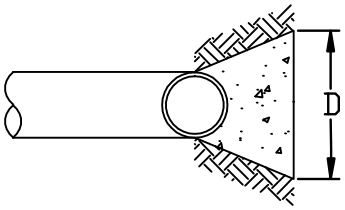
D = 1′ 0″ FOR 4″ PIPE
D = 1′ 8″ FOR 6″ PIPE
D = 2′ 3″ FOR 8″ PIPE
D = 2′ 8″ FOR 10″ PIPE

SECTION



D = 1′ 0″ FOR 4″ PIPE
D = 1′ 6″ FOR 6″ PIPE
D = 1′ 10″ FOR 8″ PIPE
D = 2′ 4″ FOR 10″ PIPE

SECTION

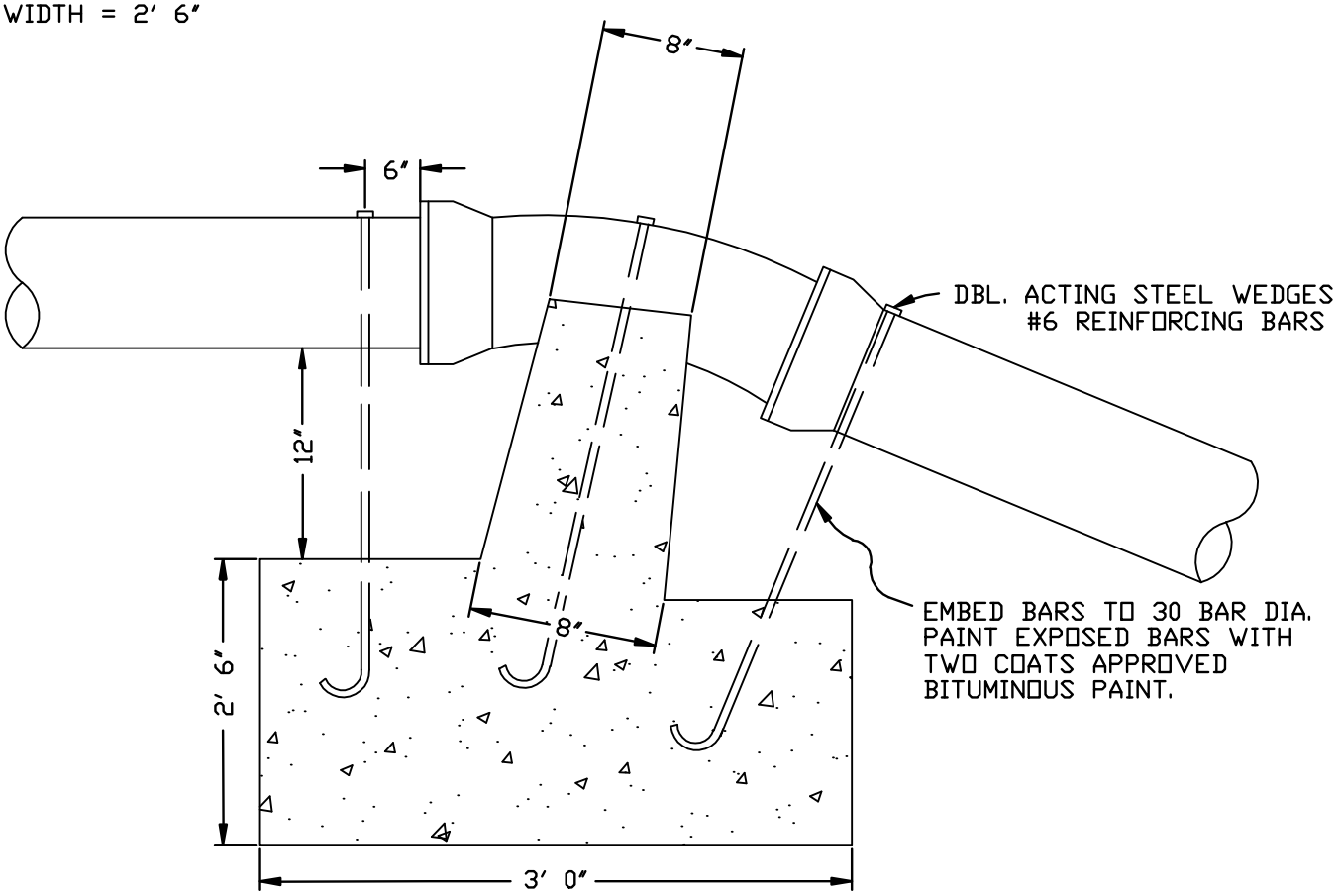


D = 1′ 0″ FOR 4″ PIPE
D = 1′ 3″ FOR 6″ PIPE
D = 1′ 5″ FOR 8″ PIPE
D = 2′ 0″ FOR 10″ PIPE

MEGA-LUG ALTERNATIVE FOR BENDS 22 1/2° AND LESS

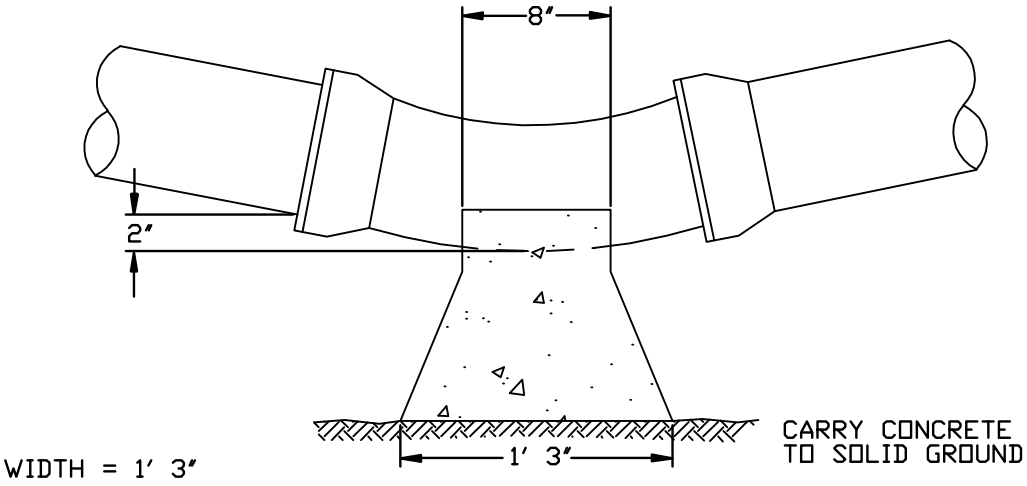
CITY OF STAUNTON, VA	**THRUST BLOCK DETAILS**	Draw No. **W-14**

WIDTH = 2′ 6″

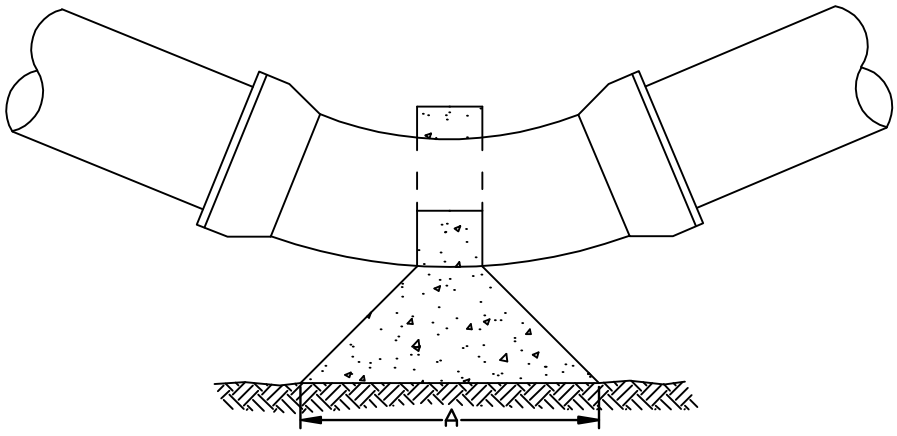


MEGA-LUG ALTERNATIVE FOR BENDS 22 1/2° OR LESS

CITY OF STAUNTON, VA	THRUST BLOCK VERTICAL BEND	Draw No. W-15



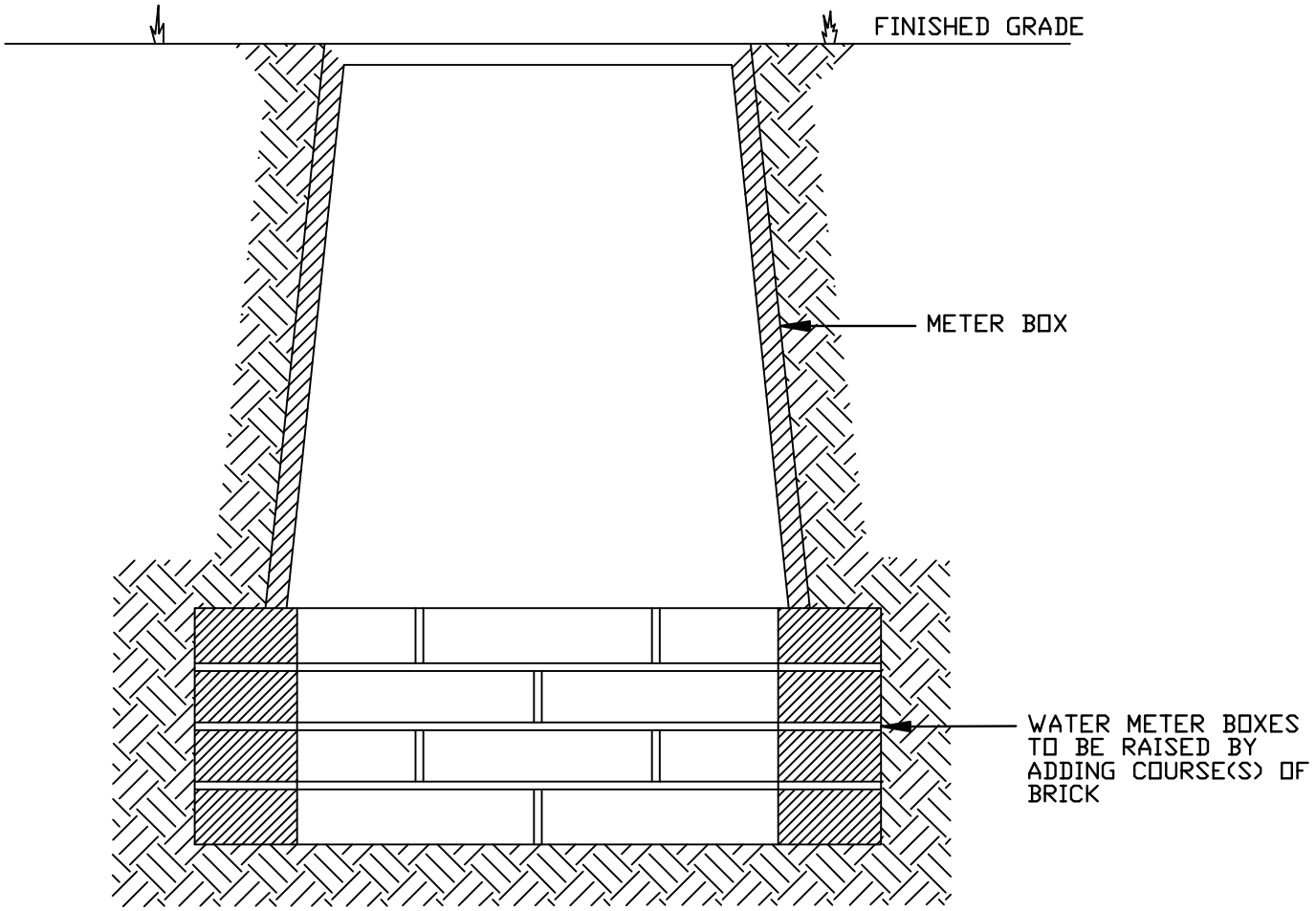
WIDTH = 1′ 3″



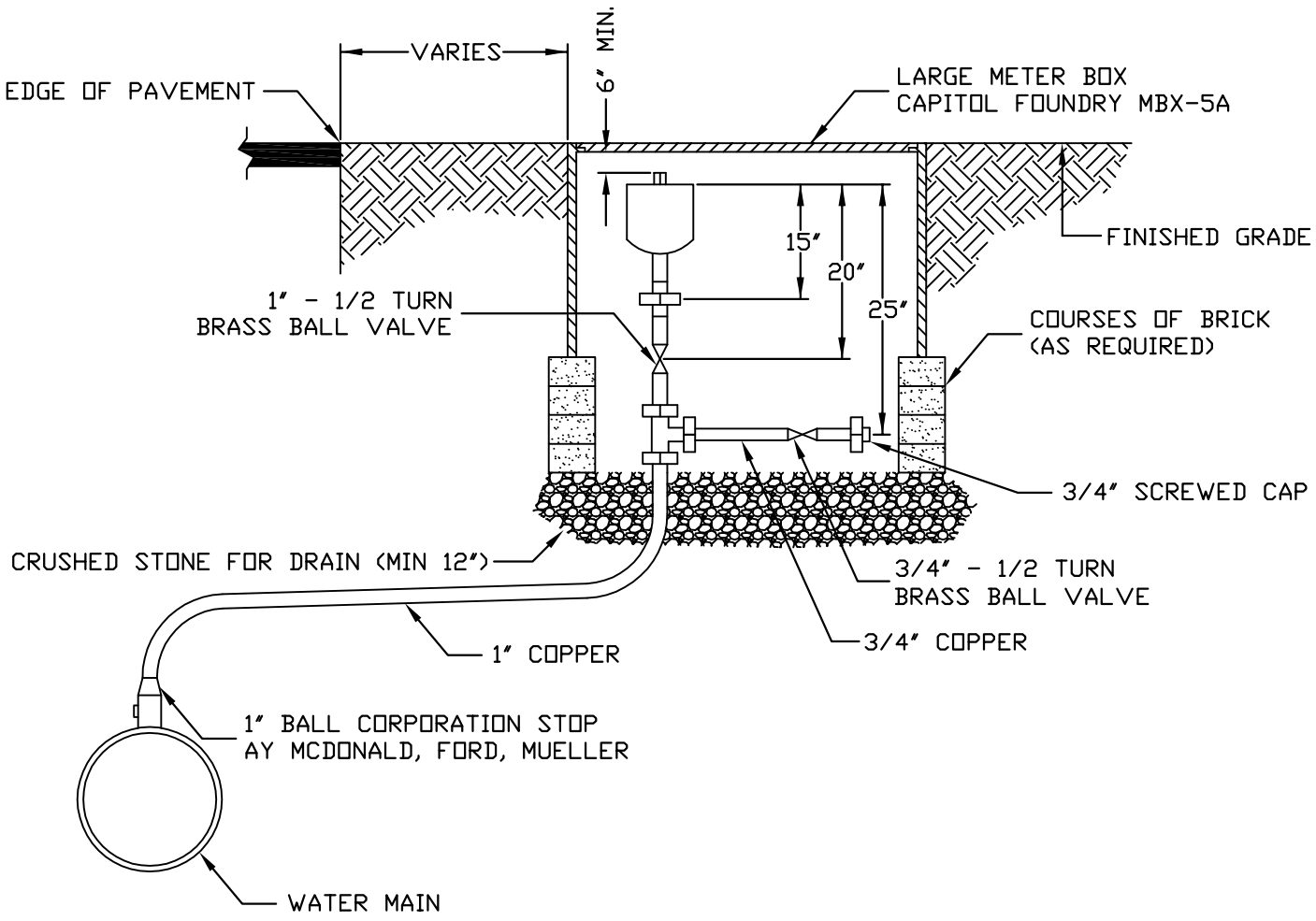
BEND	A
11 1/4°	1′ 3″
22 1/2°	1′ 3″
45°	1′ 3″
90°	2′ 0″

MEGA-LUG ALTERNATIVE FOR BENDS 22 1/2° OR LESS

CITY OF STAUNTON, VA	**THRUST BLOCK HORIZONTAL & VERTICAL BENDS**	**Draw No. W-16**

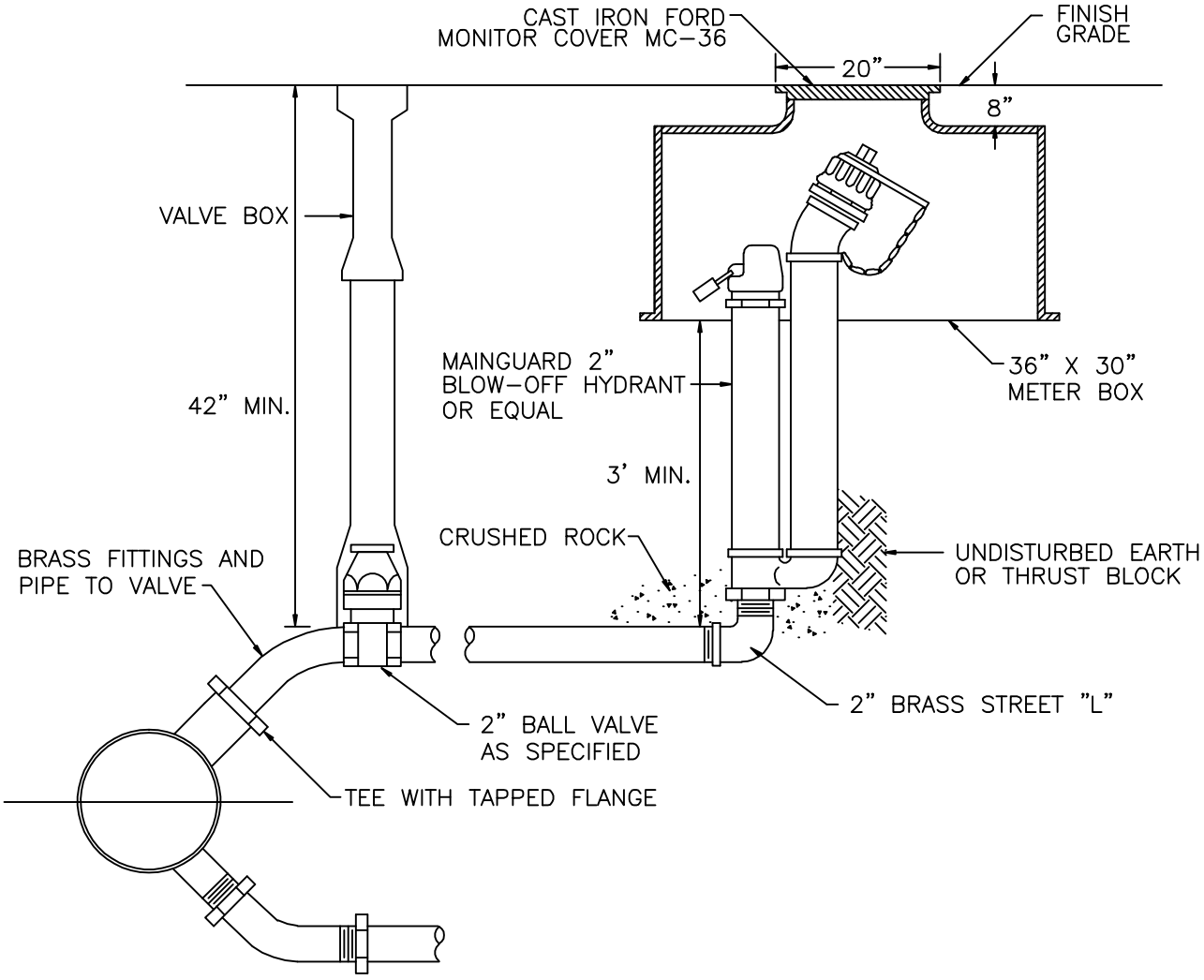


CITY OF STAUNTON, VA	WATER METER BOX ADJUSTMENT	Draw No. W-17



NOTES:
1. ALL COPPER CONNECTIONS AND FITTINGS SHALL BE COMPRESSION
2. AIR RELIEF VALVE TO BE VALMATIC 202C.1

CITY OF STAUNTON, VA	**1" AIR RELIEF VALVE INSTALLATION**	Draw No. **W-18A**



ROTATE TEE AT AN ANGLE OF 45° UP OR DOWN
AS REQUIRED FOR BLOW OFF OR BLOW DOWN ASSEMBLY

POST HYDRANTS SHALL BE NON-FREEZING, SELF DRAINING TYPE WITH A 3.5 FOOT BURY, SET UNDER GROUND IN A METER BOX. THESE HYDRANTS SHALL BE FURNISHED WITH A 2 INCH FIP INLET, A NON-TURNING OPERATING ROD, AND SHALL OPEN COUNTER-CLOCKWISE. ALL OF THE WORKING PARTS SHALL BE OF BRONZE-TO-BRONZE DESIGN, AND BE SERVICABLE FROM ABOVE GRADE WITH NO DIGGING. THE OUTLET SHALL ALSO BE BRONZE AND BE 2-1/2 INCH NST. HYDRANTS SHALL BE LOCKABLE TO PREVENT UNAUTHORIZED USE. HYDRANTS SHALL BE SIMILAR TO KUPFERLE FOUNDRY CO. MAINGUARD NO. 78 OR APPROVED EQUAL.

DRAIN HOLE SHALL BE PLUGGED IF IT WILL BE BELOW SEASONAL GROUNDWATER LEVELS.

CITY OF STAUNTON, VA	**BLOW-OFF VALVE INSTALLATION**	Draw No. **W-20**

FY 19 WATER LINE IMPROVEMENTS

GENERAL NOTES

1. THIS PROJECT IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, SPECIAL CONDITIONS, CITY OF STAUNTON DESIGN AND CONSTRUCTION STANDARDS, VDOT ROAD AND BRIDGE STANDARDS, HEALTH DEPARTMENT WATER WORKS AND SEWERAGE REGULATIONS AND ANY OTHER APPLICABLE STANDARDS.
2. ALL MATERIAL USED ON THIS PROJECT SHALL BE NEW AND COMPLY WITH THE LATEST REVISION OF THE APPLICABLE AMERICAN SOCIETY OF TESTING AND MATERIALS (ASTM), AMERICAN WATERWORKS ASSOCIATION (AWWA), AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) & VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) ROAD & BRIDGE STANDARDS & SPECIFICATIONS UNLESS OTHERWISE NOTED.
3. THE LOCATION OF EXISTING UTILITIES AS SHOWN ON THE PLANS ARE AS THEY WERE KNOWN AT THE TIME THE PLANS WERE PREPARED. HOWEVER, NOTHING IN THE CONTRACT DOCUMENTS SHALL BE CONSTRUED AS A GUARANTEE THAT SUCH UTILITIES ARE IN THE LOCATION INDICATED OR THAT THEY ACTUALLY EXIST, OR THAT OTHER UTILITIES ARE NOT IN THE AREA OF OPERATION. THE CONTRACTOR SHALL MAKE ALL NECESSARY INVESTIGATIONS TO DETERMINE THE EXISTENCE AND LOCATION OF SUCH LINES. THE CONTRACTOR SHALL PAY FOR ANY DAMAGE TO AND FOR MAINTENANCE AND PROTECTION OF EXISTING UTILITIES AND STRUCTURES.
   CALL MISS UTILITY 48 HOURS IN ADVANCE OF DIGGING.
4. THE CONTRACTOR IS TO DIG & LOCATE EXISTING UTILITIES IN ADVANCE OF PIPE LAYING TO ALLOW FOR HORIZONTAL AND VERTICAL ALIGNMENT ADJUSTMENT.
5. UTILITY SERVICES SHALL BE UNINTERRUPTED UNLESS PRIOR APPROVAL IS GIVEN BY THE CITY ENGINEER. THE CONTRACTOR IS REQUIRED TO HANG (CITY PROVIDED) NOTICES ON ALL CUSTOMER DOORS 24 HOURS PRIOR TO UTILITY SHUT-OFFS.
6. MAINTAIN 18" VERTICAL CLEARANCE AT ALL SANITARY SEWER CROSSINGS, AND 12" CLEARANCE AT ALL STORM SEWER CROSSINGS. MAINTAIN 10 FEET HORIZONTAL DISTANCE BETWEEN WATER LINES AND SANITARY SEWER LINES AND MANHOLES.
7. WATERLINE APPURTENANCES SHALL BE LOCATED AWAY FROM DRAINAGE PATTERNS.
8. ALL TOPSOIL, SEEDING & MULCHING OPERATIONS ARE TO FOLLOW IMMEDIATELY BEHIND PIPE LAYING OPERATIONS.
9. ALL PAVEMENT REPAIR IS TO BE KEPT UP WITH LINE INSTALLATION AS DIRECTED BY INSPECTOR.
10. ALL SALVAGE ITEMS REMOVED FROM THE PROJECT SHALL BE DEPOSITED AT THE CITY SALVAGE YARD.
11. ALL TRAFFIC CONTROL DEVICES MUST BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND THE VIRGINIA WORK AREA PROTECTION MANUAL.
12. EXISTING LINES ARE NOT TO BE ABANDONED UNTIL ALL SERVICES IN THE PROJECT AREA ARE CONNECTED TO NEW LINES.
13. CONTACTS FOR ASSOCIATED UTILITY COORDINATION ARE:

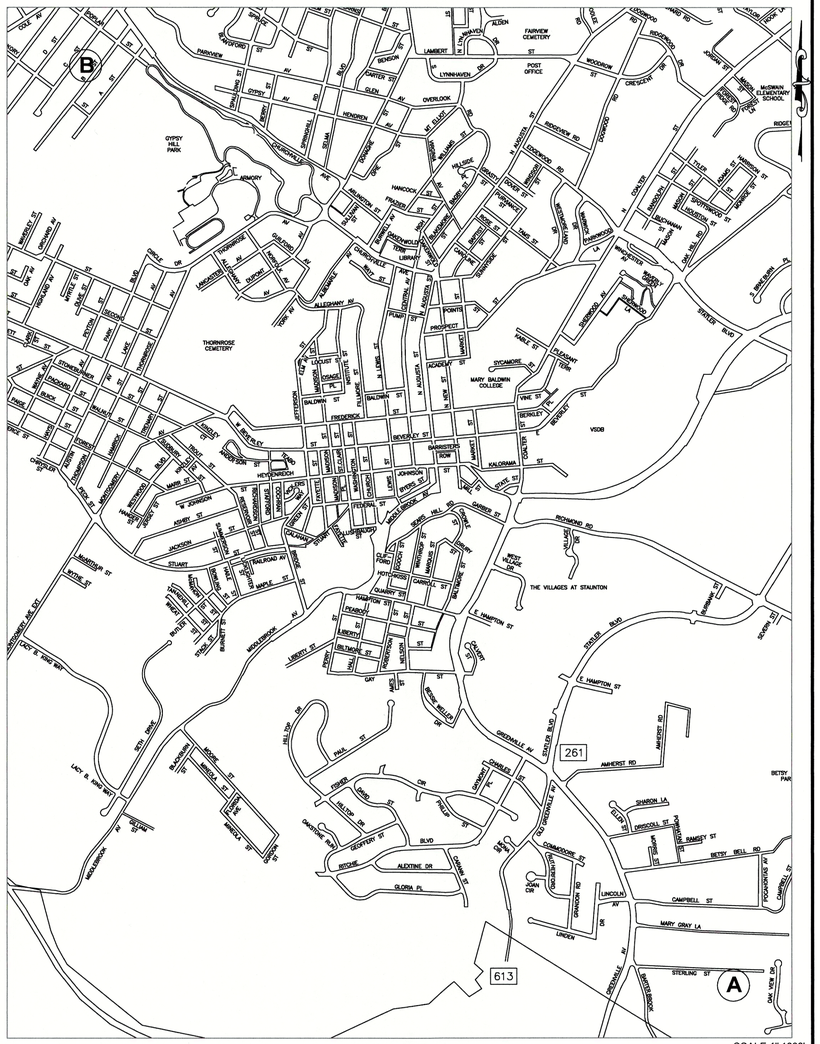
COLUNBIA GAS	TERRY HOWARD	290-0203
VIRGINIA POWER	RICH PARASKA	245-4121
COMCAST	ROB CROSIER	887-3461
VERIZON	CALVIN JOHNSON	434-841-8570

14. DRAWINGS FOR THESE PROJECTS ARE BASED ON AVAILABLE RECORDS, SUPPLEMENTED WITH A LIMITED AMOUNT OF FIELD SURVEY.

JULY 2018

CITY OF STAUNTON
116 W. Beverley Street
P.O. Box 58
Staunton, Virginia 24402

City Engineer: Nickie D. Mills, P.E.
Phone: 540-332-3858



LOCATION MAP

C STREET LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
OHE — OHE	EXISTING OVERHEAD ELECTRIC	2 w — 2 w	EXISTING 2" WATER LINE
t — t	EXISTING TELEPHONE	6 w — 6 w	EXISTING 6" WATER LINE
ug — ug	EXISTING GAS	8 w — 8 w	EXISTING 8" WATER LINE
ue — ue	EXISTING UNDERGROUND ELECTRIC		EXISTING GATE VALVE
	EXISTING UTILITY POLE		EXISTING FIRE HYDRANT
	EXISTING GUY		
	EXISTING LIGHT POST		EXISTING WATER METER
	EXISTING SIGN POST	W	PROPOSED WATER LINE
	EXISTING MAILBOX		PROPOSED GATE VALVE
XXX	EXISTING 10' CONTOUR		
XXX	EXISTING 2' CONTOUR		PROPOSED FIRE HYDRANT
ss — ss	EXISTING SANITARY SEWER MAIN		PROPOSED BLOWOFF
S	EXISTING SANITARY SEWER MANHOLE		WATER METERS TO BE REPLACED
C	EXISTING SANITARY SEWER CLEANOUT		

This project's topographic and utility information mapping was completed under the direct and responsible charge of Nickie D. Mills, P.E., from an actual ground survey made under my supervision in May 2018. The survey information on this drawing meets minimum accuracy standards unless otherwise noted.

Data shown outside the limits of the actual field survey (beyond roadway edge of pavement) was obtained from Staunton GIS Database.

COMMONWEALTH OF VIRGINIA
NICKIE D. MILLS
Lic. No. 031205
8-23-18
PROFESSIONAL ENGINEER

PROJECT SITES

A	STERLING STREET EXTENSION
B	C STREET

SHEET INDEX

SHEET 1	TITLE SHEET
SHEET 2-13	STERLING STREET EXTENSION
SHEET 14	C STREET

SH. 1 OF 14

STERLING STREET WATERLINE

CITY OF STAUNTON, VIRGINIA

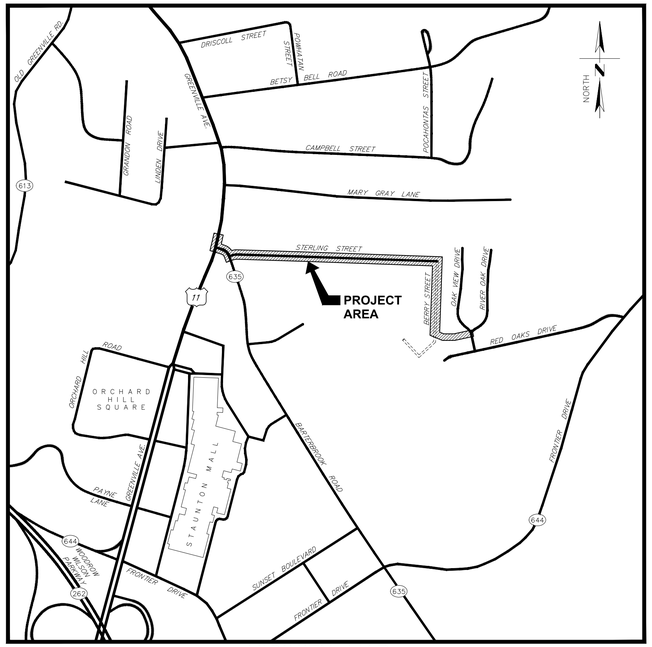
LEGEND

EXISTING FEATURES:

- DROP INLET & STORM SEWER
- STORM SEWER MANHOLE
- SANITARY SEWER & MANHOLE
- CLEANOUT
- WATER MAIN
- WATER VALVE
- WATER METER
- CHECK VALVE
- FIRE HYDRANT
- WELL (POTABLE)
- GAS LINE
- GAS VALVE
- GAS DRIP
- POWER POLE
- LIGHT POLE / STREET LAMP
- MONITORING WELL
- OVERHEAD TELEPHONE LINE
- OVERHEAD POWER LINE
- OVERHEAD COMMUNICATION LINE
- CONTOUR LINE
- TREE LINE
- UNDERGROUND TELEPHONE
- UNDERGROUND POWER
- EDGE OF PAVEMENT
- BOLLARD
- WOODEN POST
- METAL POST
- BENCHMARK
- UTILITY DATA ACCORDING TO RECORD (NOT FIELD LOCATED)
- LIMITS OF ACTUAL TOPOGRAPHIC FIELD SURVEY

PROPOSED FEATURES:

- NEW WATERLINE
- TAPPING SLEEVE AND VALVE
- GATE VALVE AND BOX
- FIRE HYDRANT
- WATER METER ASSEMBLY
- WATER MAIN FITTINGS (TEE, 90°, 45°, 22.5°, 11.25°)
- AIR RELEASE VALVE
- BLOW-OFF ASSEMBLY
- SILT FENCE (SF)
- INLET PROTECTION (IP)
- TEMPORARY SEEDING (TS) (DURING CONSTRUCTION)
- PERMANENT SEEDING (PS) (AT PROJECT COMPLETION)
- SOIL STABILIZATION MAT (B/M) (SEE SHEET 6 AND 7)
- CONSTRUCTION ENTRANCE (CE) (SEE SHEET 6)
- PERMANENT UTILITY EASEMENT
- (A) NEW WATER SERVICE AND METER ASSEMBLY
- (B) NEW WATER SERVICE ONLY



VICINITY MAP
1"= 600'

NOVEMBER 30, 2017

DRAPER ADEN ASSOCIATES REVIEW

THESE PLANS HAVE BEEN SUBJECTED TO TECHNICAL AND QUALITY REVIEWS BY:

NAME: PRINTED	SIGNATURE	DATE
H. LANCE JAMES PROJECT DESIGNER	H. Lance James	7/ 20 /18
MICHAEL S. HAGGERTY PROJECT MANAGER		7/ 20 /18
VICTOR H. VALENZUELA QUALITY REVIEWER		7/ 20 /18

These documents, including drawings and specifications, were prepared by Draper Aden Associates, Consulting Engineers, pursuant to a contract by and between Draper Aden Associates and City of Staunton, Virginia with respect to the project described in said contract. Any reuse or modification of said documents (whether hard copy or electronic) without written verification or adaptation by Draper Aden Associates for the specific purpose intended will be at the sole risk of the individual or entity utilizing said documents, drawings and specifications and such use is without the authorization of Draper Aden Associates. Draper Aden Associates, Consulting Engineers, shall have no legal liability resulting from any and all claims, damages, losses, and expenses, including attorney's fees arising out of the unauthorized use of these documents, drawings, specifications, reports, and studies prepared as a result of the aforesaid contract.

NOTE: CONTRACTOR TO CONTACT MISS UTILITY (811) IN ADVANCE OF PLANNED WORK. ADVANCE TIME PERIOD SHALL BE IN ACCORDANCE WITH CURRENT MISS UTILITY GUIDELINES (www.missutilityofvirginia.com).



DRAWING INDEX

SHEET No.	SHEET TITLE
1	COVER SHEET
2	NOTES
3	INDEX SHEET
4	PLAN & PROFILE
5	PLAN & PROFILE
6	PLAN & PROFILE
7	PLAN & PROFILE
8	TRAFFIC CONTROL PLAN - TYPICAL WORK ZONES
9	TRAFFIC CONTROL PLAN
10 - 11	DETAILS
12	EROSION & SEDIMENT CONTROL DETAILS

This project's existing topographic information and utility data was completed under the direct and responsible charge of Cheryl A. Stockton, L.S., from an actual ☒ ground or ☐ airborne survey made under my supervision; that the imagery and/or original data was obtained in August 2017; and that this plat, map or geospatial data including metadata meets minimum accuracy standards unless otherwise noted.

SIGNATURE

CHERYL A. STOCKTON — 2/23/18
NAME (PRINT) — DATE

Data shown outside the limits of the actual field survey was obtained thus:

City of Staunton GIS Database on August 2017.

COMMONWEALTH OF VIRGINIA
MICHAEL S. HAGGERTY
Lic. No. 35201
7/20/18
PROFESSIONAL ENGINEER

Draper Aden Associates
Engineering • Surveying • Environmental Services
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Richmond, VA 23228
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• Charlottesville, VA • Fayetteville, NC
• Hampton Roads, VA • Northern Virginia

COVER SHEET
STERLING STREET WATERLINE
CITY OF STAUNTON, VIRGINIA

REVISIONS
03/08/18
PER CITY COMMENTS
6/10/18
PER CITY COMMENTS
7/10/18
PER CITY COMMENTS

DESIGNED BY: BMC
DRAWN BY: HLJ
CHECKED BY: MSH
SCALE: NOT TO SCALE
DATE: NOVEMBER 30, 2017
PROJECT NUMBER: 17020587-0103

1
1 OF 12

P:\2017\17020500\17020587\17020587-0103\CAD\Sterling Street (Main)\ESIGNs\17020587-0103_COVER.dwg, July 23, 2018 9:39:30 AM

GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THESE DRAWINGS, THE ACCOMPANYING PROJECT MANUAL AND THE LATEST EDITION OF THE CITY OF STAUNTON (CITY) INFRASTRUCTURE DESIGN & CONSTRUCTION STANDARDS AVAILABLE AT:

   WWW.CI.STAUNTON.VA.US/DEPARTMENTS/ENGINEERING–DIVISION/DESIGN–CONSTRUCTION–STANDARDS.

   ADDITIONALY, THIS PROJECT IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE VDOT ROAD & BRIDGE STANDARDS, VIRGINIA DEPARTMENT OF HEALTH WATERWORKS REGULATIONS, VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY SEWAGE COLLECTION AND TREATMENT (SCAT) REGULATIONS, AND ANY OTHER APPLICABLE STANDARDS.

2. ALL MATERIALS USED ON THIS PROJECT SHALL BE NEW AND COMPLY WITH THE LATEST REVISION OF THE APPLICABLE AMERICAN SOCIETY FOR TESTING & MATERIALS (ASTM), AMERICAN WATERWORKS ASSOCIATION (AWWA), AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), AND VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) ROAD & BRIDGE STANDARDS & SPECIFICATIONS UNLESS OTHERWISE NOTED.

3. AN APPROVED SET OF PLANS AND PERMITS SHALL BE AVAILABLE AT THE CONSTRUCTION SITE AT ALL TIMES.

4. HORIZONTAL DATUM IS VIRGINIA STATE PLANE COORDINATE SYSTEM NORTH ZONE NAD 83. VERTICAL DATUM IS NAVD 88.

5. THE CONTRACTOR SHALL HAVE A VALID MISS UTILITY TICKET PRIOR TO EXCAVATION. CONTACT MISS UTILITY AT 811 AT LEAST SEVENTY–TWO (72) HOURS PRIOR TO ANY EXCAVATION.

6. THE LOCATION OF EXISTING UTILITIES, INCLUDING UNDERGROUND UTILITIES, IS INDICATED ON THE DRAWINGS INSOFAR AS THEIR EXISTENCE AND LOCATION WERE KNOWN AT THE TIME OF PREPARTION OF THE DRAWINGS. HOWEVER, NOTHING IN THESE CONTRACT DOCUMENTS SHALL BE CONSTRUED AS A GUARANTEE THAT SUCH UTILITIES ARE IN THE LOCATION INDICATED OR THAT THEY ACTUALLY EXIST, OR THAT OTHER UTILITIES ARE NOT WITHIN THE AREA OF OPERATIONS. THE CONTRACTOR SHALL MAKE ALL NECESSARY INVESTIGATIONS TO DETERMINE THE EXISTENCE AND LOCATIONS OF SUCH UTILITIES FAR ENOUGH IN ADVANCE TO ALLOW FOR ADJUSTMENT DUE TO CONFLICTS IN THE HORIZONTAL AND VERTICAL LOCATION OF THE PIPE. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR ANY DAMAGE TO AND FOR MAINTENANCE AND PROTECTION OF EXISTING UTILITIES AND STRUCTURES.

7. THE CONTRACTOR SHALL DIG AND LOCATE EXISTING UTILITIES IN ADVANCE OF PIPE LAYING TO ALLOW FOR HORIZONTAL AND VERTICAL ALIGNMENT ADJUSTMENTS IF NECESSARY.

8. FIELD CHANGES SHALL BE APPROVED BY THE CITY OF STAUNTON'S ENGINEERING DEPARTMENT PRIOR TO SUCH CONSTRUCTION.

9. PRIOR TO COMMENCING WORK, THE CONTRACTOR'S CERTIFIED RESPONSIBLE LAND DISTURBER SHALL OBTAIN AN EROSION AND SEDIMENT CONTROL PERMIT FOR THE PROJECT FROM THE LOCAL GOVERNING JURISDICTION. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND SHALL BE INSTALLED PRIOR TO CONSTRUCTION.

10. CONTRACTOR SHALL CONTINUOUSLY MAINTAIN RECORD DRAWINGS DURING THE PROGRESS OF THE WORK.

11. CONTRACTOR SHALL RECORD PRE–CONSTRUCTION AND POST–CONSTRUCTION VIDEOS TO DOCUMENT SITE CONDITIONS.

12. THE CONTRACTOR SHALL MAKE PROVISIONS TO PROVIDE ACCESS TO ALL PROPERTIES DURING CONSTRUCTION AND SHALL MAINTAIN ACCESSIBILITY TO FIRE HYDRANTS AT ALL TIMES.

13. SITE IS LOCATED IN A RESIDENTIAL AREA. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO MINIMIZE DISTURBANCES TO ADJACENT PROPERTIES, INCLUDING PREVENTION OF DUST/DEBRIS INSTRUSION ONTO PROPERTIES.

14. CONSTRUCTION DEBRIS SHALL BE CONTAINERIZED IN ACCORDANCE WITH THE VIRGINIA LITTER CONTROL ACT.

15. ALL SALVAGE ITEMS REMOVED FROM THE PROJECT SHALL BE DEPOSITED AT THE CITY SALVAGE YARD.

16. FELLED TREES WITHIN THE CONSTRUCTION LIMITS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE.

17. UNREPAIRED ROADWAYS OPENED TO TRAFFIC SHALL HAVE, AT A MINIMUM, COMPACTED AGGREGATE MATERIAL VDOT 21A FLUSH WITH THE ADJACENT ROADWAY SURFACE AND SHALL BE INSPECTED AND REPAIRED ON A DAILY BASIS. SOME AREAS (GREENVILLE AVENUE AND BARTERBROOK ROAD) WILL REQUIRE A TEMPORARY PATCH UNTIL FINAL PAVING CAN BE COMPLETED.

18. OPEN TRENCHES ARE LIMITED TO 100'. ALL TRENCHES SHALL BE BACKFILLED OR PLATED AT THE END OF EACH WORK DAY OR WHEN THE CONTRACTOR IS NOT ON SITE.

19. ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE GRADED TO PRECLUDE THE PONDING OF WATER.

20. PORTIONS OF THE WATERLINE TO BE INSTALLED PASS UNDER EXISTING STORM SEWER SYSTEMS. DURING CONSTRUCTION CONTRACTOR SHALL PROTECT, SUPPORT, AND/OR REMOVE AND REPLACE EXISTING STORM SEWER PIPE AND STRUCTURES DURING WATERLINE INSTALLATION. CONTRACTOR IS ENCOURAGED TO PERFORM THESE TASKS ONLY DURING DRY WEATHER TO AVOID COMPROMISING OF STORM SEWER SYSTEM DURING A RAINFALL EVENT.

21. WATERLINES SHALL BE LAID TO LINES AND GRADES SHOWN ON THE DRAWINGS TO AVOID LOCAL HIGH POINTS AND LOW POINTS EXCEPT WHERE INDICATED.

22. THE MINIMUM COVER FOR THE NEW WATERLINE IS 36–INCHES UNLESS OTHERWISE INDICATED ON THE PLANS.

23. MAINTAIN 18" VERTICAL SEPARATION AT ALL SANITARY SEWER CROSSINGS AND 12" SEPARATION AT ALL STORM SEWER CROSSINGS. MAINTAIN 10' HORIZONTAL DISTANCE BETWEEN WATERLINES AND SANITARY SEWER LINES AND MANHOLES UNLESS OTHERWISE NOTED OR SHOWN ON THE PLANS.

24. CONTRACTOR SHALL PROVIDE AND INSTALL TAPPING SLEEVES AND VALVES. THE CITY WILL MAKE THE TAP FOR MAIN LINES (NO SERVICE TAPS WILL BE MADE BY THE CITY).

25. WATER SERVICE CONNECTIONS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF STAUNTON DETAILS W–7 "TYPE I SERVICE CONNECTION" AND "W–8 TYPE II SERVICE CONNECTION."

26. UTILITY SERVICES SHALL BE UNINTERRUPTED UNLESS PRIOR APPROVAL IS GIVEN BY THE CITY ENGINEER. THE CONTRACTOR IS REQUIRED TO HANG (CITY PROVIDED) NOTICES ON ALL CUSTOMER DOORS 24 HOURS PRIOR TO UTILITY SHUT–OFFS.

27. ABANDONMENT OF EXISTING WATER MAIN SHALL INCLUDE PHYSICAL SEPARATION OF THE ABANDONED WATER MAIN FROM THE ACTIVE WATER DISTRIBUTION SYSTEM. CONTRACTOR SHALL CUT OUT EXISTING TEE IN ACTIVE MAIN AND SLEEVE IN A NEW SECTION OF PIPE, EFFECTIVELY DISCONNECTING THE ABANDONED MAIN FROM THE MAIN TO REMAIN ACTIVE. COORDINATE SHUTOFF WITH THE CITY OF STAUNTON, NOTIFYING ENGINEERING DEPARTMENT AND PUBLIC WORKS DEPARTMENT A MINIMUM OF 48 HOURS PRIOR TO PROPOSED SHUTOFF. FILL THE FIRST FOOT OF THE ABANDONED WATER MAIN WITH FLOWABLE FILL.

28. CONTRACTOR SHALL REMOVE VALVE BOXES OF ALL VALVES TO BE ABANDONED. CONTRACTOR SHALL REMOVE ABANDONED FIRE HYDRANTS AND DELIVER TO THE CITY'S STORAGE YARD.

29. EXISTING WATERLINES ARE NOT TO BE ABANDONED UNTIL ALL SERVICES IN THE PROJECT AREA ARE CONNECTED TO THE NEW WATERLINE.

30. COORDINATE WITH THE CITY OF STAUNTON ENGINEERING DEPARTMENT FOR EQUIPMENT STAGING AND STORAGE LOCATIONS PRIOR TO MATERIALS BEING DELIVERED TO THE SITE.

EROSION CONTROL NARRATIVE

A. PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF THE INSTALLATION OF APPROXIMATELY 2,809 LINEAR FEET OF PROPOSED 8"ø DIAMETER WATER MAIN AND ALL ASSOCIATED APPURTENANCES (SERVICE LATERALS, VALVES, HYDRANTS).

THE WORK SHALL TAKE PLACE WITHIN THE RIGHT–OF–WAY OF GREENVILLE AVENUE, BARTERBROOK ROAD, STERLING STREET, BERRY STREET, AND OAK VIEW DRIVE. APPROXIMATELY 235 L.F. OF THE WORK IS ON PRIVATE PROPERTY.

THE TOTAL TEMPORARY DISTURBED AREA FOR THIS PROJECT IS APPROXIMATELY 0.51 ACRES.

B. EXISTING SITE CONDITIONS

THE PROJECT SITE IS WITHIN THE PAVED AREAS OF GREENVILLE AVENUE, BARTERBROOK ROAD, STERLING STREET AND OAK VIEW DRIVE. APPROXIMATELY 642 L.F. IS WITHIN THE RIGHT–OF–WAY OF BERRY STREET (UNDEVELOPED) AND APPROXIMATELY 235 L.F. IS WITHIN PRIVATE PROPERTY.

THERE WILL BE NO CHANGES TO EXISTING DRAINAGE PATTERNS AS A RESULT OF THIS PROJECT. ALL AREAS EXCAVATED DURING INSTALLATION OF THE PROPOSED WATER MAIN WILL BE RESTORED TO PRE–CONSTRUCTION CONDITIONS.

C. ADJACENT PROPERTY

THIS PROJECT IS COMPLETELY WITHIN THE CITY OF STAUNTON, VIRGINIA AND IS BORDERED BY GREENVILLE AVENUE (WEST), BARTERBROOK ROAD (SOUTH), STERLING STREET (NORTH), AND OAK VIEW DRIVE (EAST).

D. PLANNED OFF–SITE ACTIVITIES

NO OFF–SITE ACTIVITIES ARE PLANNED.

E. CRITICAL EROSION AREAS

THERE ARE NO GROUND SLOPES ALONG THE PROPOSED WATER MAIN ALIGNMENT THAT ARE 3:1 OR STEEPER. SILT FENCE AND CONSTRUCTION ENTRANCES INSTALLED AS PART OF THIS PROJECT SHALL BE CHECKED REGULARLY TO ENSURE THEY ARE FUNCTIONING PROPERLY.

F. EROSION AND SEDIMENT CONTROL MEASURES

1. CONSTRUCTION ENTRANCE – 3.02
   STONE CONSTRUCTION ENTRANCES WILL BE INSTALLED AT THE END OF STERLING STREET ON THE NORTH AND THE END OF THE BERRY RIGHT–OF–WAY TO REDUCE THE AMOUNT OF MUD TRANSPORTED ONTO PAVED PUBLIC ROADS BY BY MOTOR VEHICLES OR RUNOFF.
2. SILT FENCING – 3.05
   SILT FENCE SEDIMENT BARRIERS WILL BE INSTALLED DOWN SLOPE OF MINIMAL GRADED AREAS TO FILTER SEDIMENT LADEN RUNOFF.
3. STORM DRAIN INLET PROTECTION – 3.07
   STORM DRAIN INLET PROTECTION SHALL BE INSTALLED AT ALL STORM DRAINS WHERE THERE IS A POTENTIAL FOR SEDIMENT LADEN RUNOFF TO PREVENT SEDIMENT FROM ENTERING, ACCUMULATING IN, AND BEING TRANSFERRED BY THE STORM DRAIN SYSTEM.
4. SOIL STABILIZATION BLANKETS AND MATTING – 3.36
   BLANKETS AND MATTING SHALL BE USED IN THE AREAS SPECIFIED TO AID IN STABILIZATION AS REQUIRED IN GRASS LINED DITCHES/DRAINAGE SWALES AND STEEP SLOPES. BLANKETS AND MATTING SHALL BE VAE&SC HANDBOOK TREATMENT 1 VDOT SPECIFICATIONS EC–2).

G. VEGETATIVE PRACTICES

GENERAL: A PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED ON DENUDED AREAS NOT OTHERWISE PERMANENTLY STABILIZED BY CONCRETE OR PAVEMENT. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTA–BLISHED UNTIL A GROUND COVER IS ACHIEVED THAT IS UNIFORM, MATURE ENOUGH TO SURVIVE AND WILL INHIBIT EROSION. NEW VEGETATION SHALL BE MAINTAINED FOR ONE FULL YEAR AFTER PLANTING. NEW SEEDING SHALL BE SUPPLIED WITH ADEQUATE MOISTURE, ESPECIALLY LATE IN THE SEASON, AND IN ABNORMALLY HOT OR DRY WEATHER. STABILIZATION PRACTICES SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THE APPROPRIATE VESCH STANDARD AND SPECIFICATION, AND AS PER EROSION AND SEDIMENT CONTROL PLAN. SELECTION OF THE APPROPRIATE SEED MIXTURE FOR TEMPORARY SEEDING WILL DEPEND UPON THE TIME OF YEAR IT IS APPLIED.

1. TEMPORARY SEEDING – 3.31
   TEMPORARY SEEDING SHALL BE APPLIED OVER CLEARED AREAS THAT WILL NOT BE BROUGHT TO FINAL GRADE WITHIN 14 DAYS. TEMPORARY SEEDING MIXES SHALL BE AS DESCRIBED IN VESCH STANDARD AND SPECIFICATION 3.31.
   - SEQUENCE OF INSTALLATION: WHEN CLEARED AREAS WILL NOT BE BROUGHT TO FINAL GRADE WITHIN 14 DAYS.
   - MAINTENANCE: REFER TO STANDARD & SPECIFICATION 3.31; AREAS WHICH FAIL TO ESTABLISH VEGETATIVE COVER ADEQUATE TO PREVENT RILL EROSION ARE TO BE RESEEDED.
   - REMOVAL EVENT: AS NEEDED FOR FINAL GRADING.
2. PERMANENT SEEDING – 3.32
   PERMANENT SEEDING SHALL ALSO BE USED ON ALL AREAS THAT ARE NOT AT FINAL GRADE AND THAT WILL BE LEFT DORMANT FOR A PERIOD OF MORE THAN 1 YEAR. IF CONFLICTS EXIST BETWEEN THE PROJECT SPECIFI–CATIONS AND THE VESCH STANDARD & SPECIFICATION 3.32, THE MORE STRINGENT REQUIREMENT SHALL APPLY. PERMANENT SEEDING MIXES AND RATES ARE FOUND IN THE VESCH STANDARD & SPECIFICATION 3.32.
   - SEQUENCE OF INSTALLATION: WITHIN 7 DAYS OF ACHIEVING FINAL GRADE.
   - SOIL TESTING REQUIREMENTS: REFER TO STANDARD & SPECIFICATION 3.32.
   - MAINTENANCE: REFER TO STANDARD & SPECIFICATION 3.32; AREAS WHICH FAIL TO ESTABLISH VEGETATIVE COVER ADEQUATE TO PREVENT RILL EROSION ARE TO BE IMMEDIATELY RESEEDED, FOLLOWING IDENTIFICATION OF THE CAUSE OF POOR GERMINATION.

H. MULCHING – 3.35
APPLICATION OF PLANT RESIDUES OR OTHER SUITABLE MATERIALS TO THE SOIL SURFACE TO PREVENT EROSION BY PROTECTING THE SOIL SURFACE FROM RAINDROP IMPACT AND REDUCING THE VELOCITY OF OVERLAND FLOW. IT IS ALSO USED TO FOSTER THE GROWTH OF VEGETATION BY INCREASING AVAILABLE MOISTURE AND PROVIDING INSULATION AGAINST EXTREME HEAT AND COLD.

I. MAINTAINANCE

PRIOR TO ANY LAND DISTURBING ACTIVITY, CONTRACTOR SHALL PROVIDE THE NAME, CERTIFICATION INFORMATION, AND CONTACT INFORMATION OF THE DESIG–NATED RESPONSIBLE LAND DISTURBER (RLD) TO DCR.
IN GENERAL, ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CHECKED AT LEAST EVERY TWO WEEKS AND/OR AFTER EACH SIGNIFICANT RAINFALL. DURING CONSTRUCTION, THE CONTRACTOR'S DESIGNATED RLD WILL BE RESPON–SIBLE TO INSPECT AND REPAIR DAMAGED EROSION/SEDIMENT CONTROL MEASURES. THE FOLLOWING ITEMS WILL BE CHECKED IN PARTICULAR:

1. THE SILT FENCE BARRIER WILL BE CHECKED REGULARLY FOR UNDERMINING OR DETERIORATION OF THE FABRIC. SEDIMENT SHALL BE REMOVED WHEN THE LEVEL OF SEDIMENT DEPOSITION REACHES HALF WAY TO THE TOP OF BARRIER.
2. THE SEEDED AREAS WILL BE CHECKED REGULARLY TO ENSURE THAT A GOOD STAND IS MAINTAINED. AREAS SHOULD BE FERTILIZED AND RESEEDED AS NEEDED. REFER TO ESC TECHNICAL BULLETIN #4.
3. PROVIDE REMEDIAL STABILIZATION AND SEEDING FOR A PERIOD OF ONE YEAR AFTER CONSTRUCTION.

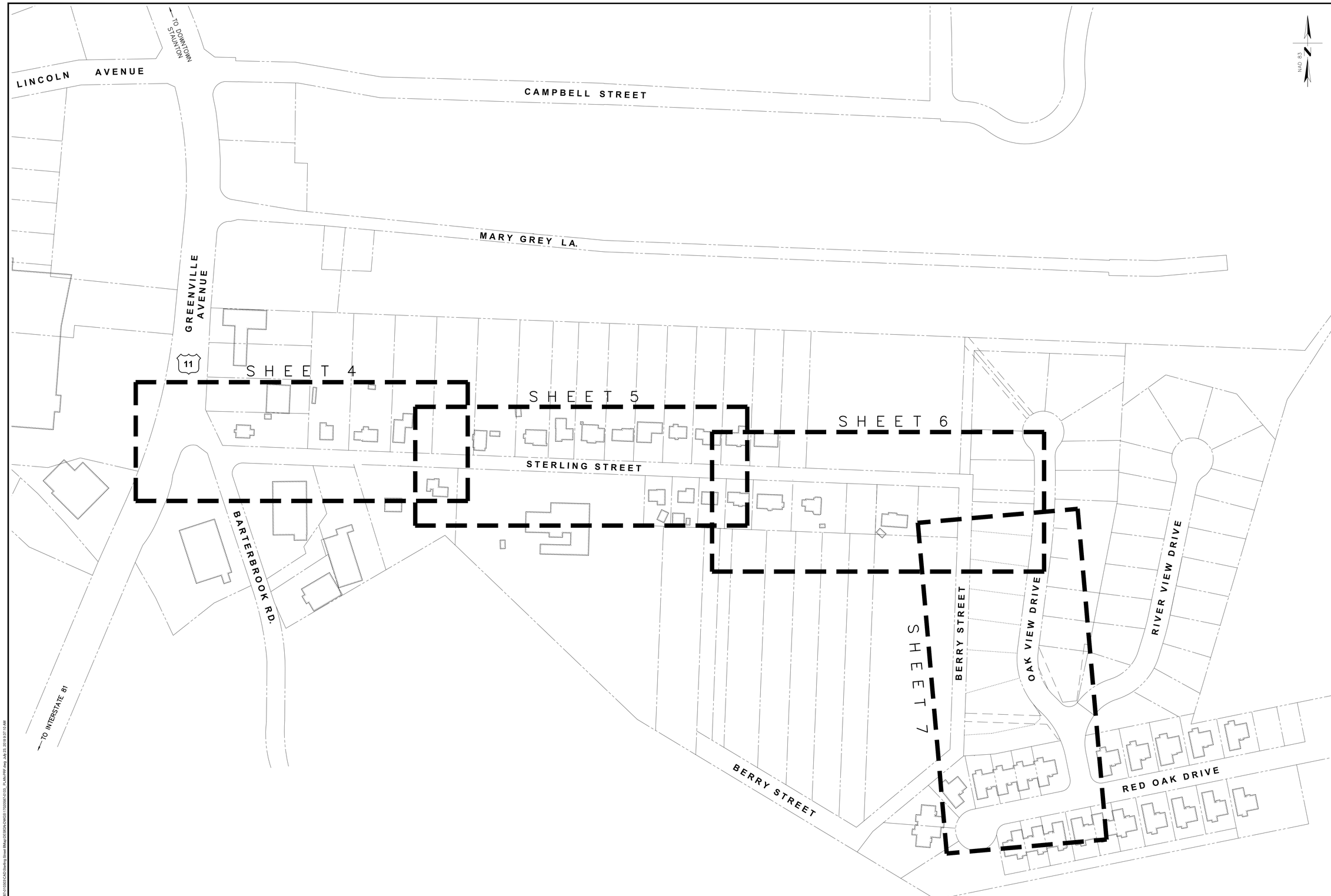
EROSION AND SEDIMENT CONTROL NOTES

1. ES–1. UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND VIRGINIA REGULATIONS VR 4VAC50–30 EROSION AND SEDIMENT CONTROL REGULATIONS.
2. ES–2. THE CITY OF STAUNTON MUST BE NOTIFIED ONE WEEK PRIOR TO THE PRE–CONSTRUCTION CONFERENCE, ONE WEEK PRIOR TO THE COMMENCEMENT OF LAND DISTURBING ACTIVITY, AND ONE WEEK PRIOR TO THE FINAL INSPECTION.
3. ES–3. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PLACED PRIOR TO OR AS THE FIRST STEP IN CLEARING, GRADING OR LAND–DISTURBING AND SEQUENCE OF CONSTRUCTION APPROVED.
4. ES–4. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.
5. ES–5. PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO, OFF–SITE BORROW OR WASTE AREAS), THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN TO THE OWNER FOR REVIEW AND APPROVAL BY THE PLAN APPROVING AUTHORITY.
6. ES–6. INSTALL ADDITIONAL EROSION CONTROL MEASURES AS NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY THE DIVISION OF SOIL AND WATER CONSERVATION OF THE DEPARTMENT OF CONSERVATION AND RECREATION.
7. ES–7. ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT, UNTIL FINAL STABILIZATION IS ACHIEVED.
8. ES–8. DURING DEWATERING OPERATIONS, WATER WILL BE PUMPED INTO AN APPROVED FILTERING DEVICE.
9. ES–9. THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES AT LEAST EVERY TWO WEEKS AND/OR AFTER EACH RUNOFF–PRODUCING RAINFALL EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY. MAINTAIN A LOG OF INSPECTIONS, MAINTENANCE PERFORMED AND REPAIRS MADE FOR INSPECTION BY THE OWNER AND THE DEPARTMENT OF CONSERVATION AND RECREATION/DIVISION OF SOIL AND WATER CONSERVATION.
10. MS–1. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN 30 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.
11. MS–2. DURING CONSTRUCTION OF THE PROJECT, SOIL STOCKPILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. COORDINATE & MAINTAIN TEMPORARY PROTECTION AND PERMANENT STABILIZATION OF ALL SOIL STOCKPILES ON SITE AS WELL AS SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE.
12. MS–3. A PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED ON DENUDED AREAS NOT OTHERWISE PERMANENTLY STABILIZED. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL A GROUND COVER IS ACHIEVED THAT, IN THE OPINION OF THE DIVISION OF SOIL AND WATER CONSERVATION OF THE DEPARTMENT OF CONSERVATION AND RECREATION, IS UNIFORM, MATURE ENOUGH TO SURVIVE AND WILL INHIBIT EROSION.
13. MS–4. SEDIMENT BASINS AND TRAPS, PERIMETER DIKES, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND–DISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAKES PLACE.
14. MS–5. STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.
15. MS–6. SEDIMENT TRAPS AND SEDIMENT BASINS SHALL BE DESIGNED AND STRUCTED BASED UPON THE TOTAL DRAINAGE AREA TO BE SERVED BY THE TRAP OR BASIN.
    A. THE MINIMUM STORAGE CAPACITY OF A SEDIMENT TRAP SHALL 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA AND THE TRAP SHALL ONLY CONTROL DRAINAGE AREAS LESS THAN THREE ACRES.
    B. SURFACE RUNOFF FROM DISTURBED AREAS THAT IS COMPRISED OF FLOW FROM DRAINAGE AREAS GREATER THAN OR EQUAL TO THREE ACRES SHALL BE CONTROLLED BY A SEDIMENT BASIN. THE MINIMUM STORAGE CAPACITY OF A SEDIMENT BASIN SHALL BE 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA. THE OUTFALL SYSTEM SHALL, AT A MINIMUM, MAINTAIN THE STRUCTURAL INTEGRITY OF THE BASIN DURING A TWENTY–FIVE YEAR STORM OF 24–HOUR DURATION. RUNOFF COEFFICIENTS USED IN RUNOFF CALCULATIONS SHALL CORRESPOND TO A BARE EARTH CONDITION OF THOSE CONDITIONS EXPECTED TO EXIST WHILE THE SEDIMENT BASIN IS UTILIZED.
16. MS–7. CUT AND FILL SLOPES SHALL BE DESIGNED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. SLOPES THAT ARE FOUND TO BE ERODING EXCESSIVELY WITHIN ONE YEAR OF PERMANENT STABILIZATION SHALL BE PROVIDED WITH ADDITIONAL SLOPE STABILIZING MEASURES UNTIL THE PROBLEM IS CORRECTED.
17. MS–8. CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CUT OR FILL SLOPES UNLESS CONTAINED WITHIN AN ADEQUATE TEMPORARY OR PERMANENT CHANNEL, FLUME OR SLOPE DRAIN STRUCTURE.
18. MS–9. WHENEVER WATER SEEPS FROM A SLOPE FACE, ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED.
19. MS–10. ALL STORM SEWER INLETS THAT ARE MADE OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT SEDIMENT–LADEN WATER CANNOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.

GENERAL EROSION CONTROL NOTES

1. RETAIN A COPY OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, 3RD EDITION ON SITE AT ALL TIMES.
2. ADHERE TO THE STANDARDS LISTED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, 3RD EDITION.

20. MS–11. BEFORE NEWLY CONSTRUCTED STORMWATER CONVEYANCE CHANNELS OR PIPES ARE MADE OPERATIONAL ADEQUATE OUTLET PROTECTION AND ANY REQUIRED TEMPORARY OR PERMANENT CHANNEL LINING SHALL BE INSTALLED IN BOTH THE CONVEYANCE CHANNEL AND RECEIVING CHANNEL.
21. MS–16. UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN ADDITION TO OTHER APPLICABLE CRITERIA:
    A. NO MORE THAN 500 LINEAR FEET OF TRENCH MAY BE OPENED AT ONE TIME UNLESS OTHERWISE NOTED.
    B. EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES.
    C. EFFLUENT FROM DEWATERING OPERATIONS SHALL BE FILTERED OR PASSED THROUGH AN APPROVED SEDIMENT TRAPPING DEVICE, OR BOTH, AND DISCHARGED IN A MANNER THAT DOES NOT ADVERSELY AFFECT OFF SITE PROPERTY.
    D. MATERIAL USED FOR BACKFILLING TRENCHES SHALL BE PROPERLY COMPACTED IN ORDER TO MINIMIZE EROSION AND PROMOTE STABILIZATION.
    E. RESTABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THESE REGULATIONS.
    F. APPLICABLE SAFETY REGULATIONS SHALL BE COMPLIED WITH.
22. MS–17. WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED OR PUBLIC ROADS, PROVISIONS SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT BY VEHICULAR TRACKING ONTO THE PAVED SURFACE. WHERE SEDIMENT IS TRANSPORTED ONTO A PAVED OR PUBLIC ROAD SURFACE, THE ROAD SURFACE SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM THE ROADS BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA. STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER. THIS PROVISION SHALL APPLY TO INDIVIDUAL DEVELOPMENT LOTS AS WELL AS TO LARGER LAND–DISTURBING ACTIVITIES.
23. MS–18. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE LOCAL PROGRAM AUTHORITY. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.
24. MS–19 PROPERTIES AND WATERWAYS DOWNSTREAM FROM DEVELOPMENT SITES SHALL BE PROTECTED FROM SEDIMENT DEPOSITION, EROSION AND DAMAGE DUE TO INCREASES IN VOLUME, VELOCITY AND PEAK FLOW RATE OF STORMWATER RUNOFF FOR THE STATED FREQUENCY STORM OF 24–HOUR DURATION IN ACCORDANCE WITH THE FOLLOWING STANDARDS AND CRITERIA:
    A. CONCENTRATED STORMWATER RUNOFF LEAVING A DEVELOPMENT SITE SHALL BE DISCHARGED DIRECTLY INTO AN ADEQUATE NATURAL OR MAN–MADE RECEIVING CHANNEL, PIPE OR STORM SEWER SYSTEM. FOR THOSE SITES WHERE RUNOFF IS DISCHARGED INTO A PIPE OR PIPE SYSTEM, DOWNSTREAM STABILITY ANALYSES AT THE OUTFALL OF THE PIPE OR PIPE SYSTEM SHALL BE PERFORMED.
    B. ADEQUACY OF ALL CHANNELS AND PIPES SHALL BE VERIFIED IN THE FOLLOWING MANNER:
       (1) THE APPLICANT SHALL DEMONSTRATE THAT THE TOTAL DRAINAGE AREA TO THE POINT OF ANALYSIS WITHIN THE CHANNEL IS ONE HUNDRED TIMES GREATER THAN THE CONTRIBUTING DRAINAGE AREA OF THE PROJECT IN QUESTION; OR
       (2) (a) NATURAL CHANNELS SHALL BE ANALYZED BY THE USE OF A TWO–YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP CHANNEL BANKS NOR CAUSE EROSION OF CHANNEL BED OR BANKS; AND
       (b) ALL PREVIOUSLY CONSTRUCTED MAN–MADE CHANNELS SHALL BE ANALYZED BY THE USE OF A TEN–YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP ITS BANKS AND BY THE USE OF A TWO–YEAR STORM TO DEMONSTRATE THAT STORMWATER WILL NOT CAUSE EROSION OF CHANNEL BED OR BANKS; AND
       (c) PIPES AND STORM SEWER SYSTEMS SHALL BE ANALYZED BY THE USE OF A TEN–YEAR STORM TO VERIFY THAT STORMWATER WILL BE CONTAINED WITHIN THE PIPE OR SYSTEM.
    C. IF EXISTING NATURAL RECEIVING CHANNELS OR PREVIOUSLY CONSTRUCTED MAN–MADE CHANNELS OR PIPES ARE NOT ADEQUATE, THE APPLICANT SHALL:
       (1) IMPROVE THE CHANNEL TO A CONDITION WHERE A TEN–YEAR STORM WILL NOT OVERTOP THE BANKS AND A TWO–YEAR STORM WILL NOT CAUSE EROSION TO THE CHANNEL BED OR BANKS; OR
       (2) IMPROVE THE PIPE OR PIPE SYSTEM TO A CONDITION WHERE THE TEN–YEAR STORM IS CONTAINED WITHIN THE APPURTENANCES; OR
       (3) DEVELOP A SITE DESIGN THAT WILL NOT CAUSE THE PRE–DEVELOPMENT PEAK RUNOFF RATE FROM A TWO–YEAR STORM TO INCREASE WHEN RUNOFF OUTFALLS INTO A NATURAL CHANNEL OR WILL NOT CAUSE THE PRE–DEVELOPMENT PEAK RUNOFF RATE FROM A TEN–YEAR STORM TO INCREASE WHEN RUNOFF OUTFALLS INTO A MAN–MADE CHANNEL; OR
       (4) PROVIDE A COMBINATION OF CHANNEL IMPROVEMENT, STORMWATER DETENTION OR OTHER MEASURES WHICH IS SATISFACTORY TO THE PLAN–APPROVING AUTHORITY TO PREVENT DOWNSTREAM EROSION.
    D. THE APPLICANT SHALL PROVIDE EVIDENCE OF PERMISSION TO MAKE THE IMPROVEMENTS.
    E. ALL HYDROLOGIC ANALYSES SHALL BE BASED ON THE EXISTING WATERSHED CHARACTERISTICS AND THE ULTIMATE DEVELOPMENT OF THE SUBJECT PROJECT.
    F. IF THE APPLICANT CHOOSES AN OPTION THAT INCLUDES STORMWATER DETENTION, HE SHALL OBTAIN APPROVAL FROM THE LOCALITY OF A PLAN FOR MAINTENANCE OF THE DETENTION FACILITIES. THE PLAN SHALL SET FORTH THE MAINTENANCE REQUIREMENTS OF THE FACILITY AND THE PERSON RESPONSIBLE FOR PERFORMING THE MAINTENANCE.
    G. OUTFALL FROM A DETENTION FACILITY SHALL BE DISCHARGED TO A RECEIVING CHANNEL, AND ENERGY DISSIPATERS SHALL BE PLACED AT THE OUTFALL OF ALL DETENTION FACILITIES AS NECESSARY TO PROVIDE A STABILIZED TRANSITION FROM THE FACILITY TO THE RECEIVING CHANNEL.
    H. ALL ON–SITE CHANNELS MUST BE VERIFIED TO BE ADEQUATE.
    I. INCREASED VOLUMES OF SHEET FLOWS THAT MAY CAUSE EROSION OR SEDIMENTATION ON ADJACENT PROPERTY SHALL BE DIVERTED TO A STABLE OUTLET, ADEQUATE CHANNEL, PIPE OR PIPE SYSTEM, OR TO A DETENTION FACILITY.
    J. IN APPLYING THESE STORMWATER RUNOFF CRITERIA, INDIVIDUAL LOTS OR PARCELS IN A RESIDENTIAL, COMMERCIAL OR INDUSTRIAL DEVELOPMENT SHALL NOT BE CONSIDERED TO BE SEPARATE DEVELOPMENT PROJECTS. INSTEAD, THE DEVELOPMENT, AS A WHOLE, SHALL BE CONSIDERED TO BE A SINGLE DEVELOPMENT PROJECT. HYDROLOGIC PARAMETERS THAT REFLECT THE ULTIMATE DEVELOPMENT CONDITION SHALL BE USED IN ALL ENGINEERING CALCULATIONS.
    K. ALL MEASURES USED TO PROTECT PROPERTIES A



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• Hampton Roads, VA • Northern Virginia

INDEX SHEET
STERLING STREET WATERLINE

CITY OF STAUNTON, VIRGINIA

REVISIONS
03/08/18
PER CITY COMMENTS

DESIGNED BY:	BMC
DRAWN BY:	HLJ
CHECKED BY:	MSH
SCALE:	1"= 100'
DATE:	NOVEMBER 30, 2017
PROJECT NUMBER:	17020587-0103

3
3 OF 12

Overall Sh. 4 of 14

J:\2017\17020587\17020587-1\1020\CAD\Drawing Sheet Files\DESIGN\VWDS\17020587-0103L_PLAN-PRF.dwg, Jul 23, 2018 8:31:10 AM

GRAPHIC SCALE
25 0 25 50
(IN FEET)
1 inch = 25 ft.

NAD 83

STA. 10+00
BEGIN PROJECT:
1– 8" X 8" TAPPING SLEEVE AND VALVE

STA. 11+54
1– 8" 22.5° BEND

STA. 11+68
1– 8" X 6" TEE
1– 6" GATE VALVE & BOX
1– FIRE HYDRANT ASSEMBLY

EXISTING 6" WATERLINE TO BE ABANDONED

REPLACE EXISTING WATER SERVICE FROM WATER METER TO NEW WATER MAIN. TYPE I SERVICE CONNECTION. POLYETHYLENE (PE) PRESSURE PIPE (MUNCIPEX OR APPROVED EQUAL) WITH TRACER WIRE. TYPICAL UNLESS OTHERWISE NOTED. (SEE DETAIL W–7)

ABANDON EXISTING 6" WATER MAIN PER GENERAL NOTE #27 ON SHEET 2

EXISTING FIRE HYDRANT TO BE REMOVED

PROPOSED 8" WATERLINE (CLASS 350 D.I. PIPE) MAINTAIN 3' MINIMUM HORIZONTAL SEPARATION BETWEEN PROPOSED 8" WATERLINE AND EXISTING 6" WATERLINE (TYP.)

MATCH LINE SHEET 5

GREENVILLE AVENUE

BARTERBROOK RD.

STERLING STREET

TBM "E"
Rod & Cap Set
Elev.= 1540.05

TBM "C"
Chiseled Square in Conc.
Elev.= 1501.77

N/F DOGWOOD SQUARE COMPANY, L.L.C. 1106 GREENVILLE AVE. PID 475 DB 390 Pg. 913

N/F HOPR SELFSTORAGE, LLC 1215 GREENVILLE AVE. PID 3068 050001532

N/F THOMAS WALTON RANKIN 1217 BARTERBROOK RD. PID 6398 050004171

N/F GREGORY E. CLARK 309 STERLING ST. PID 874 090003195

N/F CHARLES E. MILLER 313 STERLING ST. PID 5589 DB 344 Pg. 137

N/F CECIL R. & JOYCE F. WEST 315 STERLING ST. PID 556 030004553

N/F BEVERLY MCCRACKEN, ETAL. 317 STERLING ST. PID 339 WF1400011

N/F ONA L. CRUMMETTE 318 STERLING ST. PID 178 030003590

N/F JAMES W. SMILEY, JR. 1301 BARTERBROOK RD. PID 8926 140001255

N/F JAMES D. & CONNIE M. HOLLYARD 1303 BARTERBROOK RD. PID 7812 DB 329 Pg. 352

N/F CVS 1557 VA., L.L.C. 1302 BARTERBROOK RD. PID 8162 160003549

NOTES:

1. EXISTING SANITARY SEWER LATERAL LOCATIONS ARE SHOWN FROM CCTV INSPECTION PROVIDED BY THE CITY.
2. HEAVY DUTY ASPHALT SHALL BE USED FOR ANY PATCH IN GREENVILLE AVENUE. (WATERLINE STA 10+00 TO STA 10+40) IN ACCORDANCE WITH DETAIL M–5(H) ON SHEET 10.
3. STANDARD ASPHALT PATCH SHALL BE USED FOR ANY PATCH IN BARTERBROOK ROAD, STERLING STREET AND OAK VIEW DRIVE IN ACCORDANCE WITH DETAIL M–5 ON SHEET 10.
4. FLOWABLE FILL SHALL BE USED FOR WATER MAIN BACKFILL BETWEEN STA. 10+00 AND STA. 11+54.
5. REPLACE WATER METER ASSEMBLIES (METER, YOKE AND BOX) FOR THE FOLLOWING ADDRESSES:

STERLING STREET
309
313
315
318

BARTERBROOK ROAD
1217
1301

CONTRACTOR SHALL VERIFY THE DEPTH OF ALL EXISTING UTILITIES IN THE AREA PRIOR TO CONSTRUCTION. COORDINATE WITH THE CITY IF VERTICAL REALIGNMENT OF THE PROPOSED WATERLINE IS NECESSARY BASED ON THIS INVESTIGATION.

INSTALL PROPOSED 8" WATERLINE WITH 24" MINIMUM COVER

TRANSITION TO 3' MIN. COVER BY STA. 12+00

STA. 10+16
1– 8" 22.5° UPPER VERTICAL BEND

STA. 10+27
1– 8" 22.5° LOWER VERTICAL BEND

STA. 10+31
1– 8" 22.5° LOWER VERTICAL BEND

STA. 10+41
1– 8" 22.5° UPPER VERTICAL BEND

18" MIN. (TYP.)

2' MIN. COVER

3' MIN. COVER

6" MINIMUM SEPARATION BETWEEN PROPOSED 8" WATERLINE AND EXISTING 6" WATERLINE AND STORM SEWERS

PROPOSED 8" WATERLINE (CLASS 350 D.I. PIPE)

NEW WATER SERVICE (309 Sterling St.)

NEW WATER SERVICE (313 Sterling St.)

NEW WATER SERVICE (315 Sterling St.)

NEW WATER SERVICE (318 Sterling St.)

NEW WATER SERVICE (1301 Barterbrook)

NEW WATER SERVICE (1217 Barterbrook)

TO BE ABANDONED

Existing Pavement Along Sterling Street (Thickness not Field verified)

Existing Gas Main (Depth not Verified)

Ex. 36" RCP Inv.= 1496.9

Ex. U/G Tel. (Depth not Verified)

Ex. U/G Elec. (Depth not Verified)

Ex. 24" RCP Inv.= 1494.0

Exist. 6" Waterline (Depth not Verified)

Ex. 36" RCP Inv.= 1492.1

Ex. 8" San. Sew. Inv.= 1492.7

Exist. 4" Gas Main (Depth not Verified)

Exist. 6" Waterline (Depth not Verified)

Ex. U/G Tel. (Depth not Verified)

Exist. 6" F.H. Branch (Depth not Verified)

Ex. 4" San. Lateral (Depth not Verified) (309 Sterling St.)

Ex. U/G Tel. (Depth not Verified)

Ex. U/G Tel. (Depth not Verified)

Ex. Gas Service (Depth not Verified)

Ex. 4" San. Lateral (Depth not Verified) (313 Sterling St.)

Ex. 4" San. Lateral (Depth not Verified) (315 Sterling St.)

Exist. 8" Water Main

1540 1535 1530 1525 1520 1515 1510 1505 1500 1495 1490 1485

10+00 11+00 12+00 13+00 14+00 15+00 16+00

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PLAN & PROFILE
STERLING STREET WATERLINE
CITY OF STAUNTON, VIRGINIA

REVISIONS
03/08/18 PER CITY COMMENTS
7/10/18 PER CITY COMMENTS

DESIGNED BY: BMC
DRAWN BY: HLJ
CHECKED BY: MSH
SCALE: HORZ: 1"= 25' VERT: 1"=5'
DATE: NOVEMBER 30, 2017
PROJECT NUMBER: 17020587-0103

4
4 OF 12

GRAPHIC SCALE
25 0 25 50
(IN FEET)
1 inch = 25ft.

NAD 83

STA. 18+70
1– 8" GATE VALVE & BOX
1– 8" X 6" TEE
1– 6" GATE VALVE & BOX
1– FIRE HYDRANT ASSEMBLY

EXISTING 6" WATERLINE TO BE ABANDONED

PROPOSED 8" WATERLINE (CLASS 350 D.I. PIPE)
MAINTAIN 3' MINIMUM HORIZONTAL SEPARATION BETWEEN PROPOSED 8" WATERLINE AND EXISTING 6" WATERLINE (TYP.)

EXISTING FIRE HYDRANT TO BE REMOVED

CONNECT TO EXISTING 2" WATER SERVICE AND PROVIDE FITTINGS AS REQUIRED. CONTRACTOR SHALL VERIFY SIZE AND MATERIAL AND MATCH EXISTING.

REPLACE EXISTING WATER SERVICE FROM WATER METER TO NEW WATER MAIN. TYPE I SERVICE CONNECTION. POLYETHYLENE (PE) PRESSURE PIPE (MUNCIPEX OR APPROVED EQUAL) WITH TRACER WIRE. TYPICAL UNLESS OTHERWISE NOTED. (SEE DETAIL W-7)

N/F BEVERLY MCCRACKEN, ETAL. 317 STERLING ST. PID 339 WF1400011
N/F BEVERLY MCCRACKEN, ETAL. 401 STERLING ST. PID 338 WF1400011
N/F BEVERLY MCCRACKEN, ETAL. 409 STERLING ST. PID 694 WF1400011
N/F PATRICIA ANN & CLYDE W. DAVIS 411 STERLING ST. PID 1028 020001883
N/F GLENN M., JR. & GLENDA H. ALTIZER 413 STERLING ST. PID 51 DB 240 Pg. 18
N/F ONA L. CRUMMETTE 415 STERLING ST. PID 1945 WF0400089
N/F CHARLOTTE W. GREGGER 417 STERLING ST. PID 3730 0100002257
N/F JOSHUA G. & KRISTEN L. LOUK 419 STERLING ST. PID 4217 090000132
N/F CARTER W. RAAB 421 STERLING ST. PID 5245 120001822
N/F JAMES L. & ANNE F. HARRIS 423 STERLING ST. PID 8795 000004190
N/F ONA L. CRUMMETTE 518 STERLING ST. PID 178 030003590
N/F LINDA BEULAH WHISTLEMAN 422 STERLING ST. PID 8555 DB 194 Pg. 291
N/F DONALD L. MAYBUSH, JR. & BRENT E. MAYBUSH 424 STERLING ST. PID 5166 130002880
N/F LINDA S. BOCOCK 426 STERLING ST. WF00800121
N/F LINDA S. BOCOCK 428 STERLING ST. PID 6701 DB 431 Pg. 298
N/F POTOMAC CONGREGATION 7TH DAY ADVENTIST CHURCH 414 STERLING ST. PID 9177

STERLING STREET

MATCH LINE SHEET 4
MATCH LINE SHEET 6

★TBM "E" Rod & Cap Set Elev.= 1540.05
★TBM "E" PK Set Elev.= 1560.29

Ex. San. MH Top= 1550.72 Inv. in= 1546.96 (E) Inv. out= 1546.93 (W)
Ex. San. MH Top= 1566.37 Inv. in= 1564.12 (4"NE) Inv. in= 1563.99 (6"E) Inv. out= 1563.96 (8"W)

Limits of Topographic Survey (Typ.)

NOTES:

1. EXISTING SANITARY SEWER LATERAL LOCATIONS ARE SHOWN FROM CCTV INSPECTION PROVIDED BY THE CITY.
2. REPLACE WATER METER ASSEMBLIES (METER, YOKE AND BOX) FOR THE FOLLOWING ADDRESSES:

STERLING STREET
401 419
411 421
413 422
414 424
415 426
417

BARTERBROOK ROAD
1217
1301

1575 1570 1565 1560 1555 1550 1545 1540 1535 1530 1525

17+00 18+00 19+00 20+00 21+00 22+00 23+00

NEW WATER SERVICE (318 Sterling St.)
Ex. Gas Service (Depth not Verified)
Ex. 4" San. Lateral (Depth not Verified) (401 Sterling St.)
NEW WATER SERVICE (401 Sterling St.)
Ex. Gas Service (Depth not Verified)
NEW WATER SERVICE (409 Sterling St.)
Ex. 4" San. Lateral (Depth not Verified) (409 Sterling St.)
NEW WATER SERVICE (411 Sterling St.)
Ex. 4" San. Lateral (Depth not Verified) (411 Sterling St.)
NEW WATER SERVICE (413 Sterling St.)
Exist. 6" F.H. Branch (Depth not Verified) TO BE ABANDONED
Ex. 4" San. Lateral (Depth not Verified) (413 Sterling St.)
NEW WATER SERVICE (413 Sterling St.)
Ex. 4" San. Lateral (Depth not Verified) (415 Sterling St.)
Ex. Gas Service (Depth not Verified)
Ex. 4" San. Lateral (Depth not Verified) (417 Sterling St.)
Ex. Gas Service (Depth not Verified)
NEW WATER SERVICE (415 Sterling St.)
Ex. Gas Service (Depth not Verified)
NEW WATER SERVICE (417 Sterling St.)
NEW WATER SERVICE (422 Sterling St.)
Ex. 4" San. Laterals (3) (Depth not Verified) (419 Sterling St.)
NEW WATER SERVICE (424 Sterling St.)
NEW WATER SERVICE (419 Sterling St.)
Ex. Gas Service (Depth not Verified)
Ex. 4" San. Laterals (3) (Depth not Verified) (421 Sterling St.)
NEW WATER SERVICE (426 Sterling St.)
NEW WATER SERVICE (421 Sterling St.)
Ex. Gas Service (Depth not Verified)
Ex. 4" San. Lateral (Inv.= 1564.22) (423 Sterling St.)

Existing Pavement Along Sterling Street (Thickness not Field verified)
Ex. Gas Service
3' MIN. COVER
12"
18" MIN.
PROPOSED 8" WATERLINE (CLASS 350 D.I. PIPE)

MATCH LINE SHEET 4
MATCH LINE SHEET 6

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PLAN & PROFILE STERLING STREET WATERLINE

CITY OF STAUNTON, VIRGINIA

REVISIONS
03/08/18 PER CITY COMMENTS
7/10/18 PER CITY COMMENTS

DESIGNED BY: BMC
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DATE: NOVEMBER 30, 2017
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5 OF 12

PROPOSED 8" WATERLINE (CLASS 350 D.I. PIPE) MAINTAIN 3' MINIMUM HORIZONTAL SEPARATION BETWEEN PROPOSED 8" WATERLINE AND EXISTING 6" WATERLINE (TYP.)

EXISTING 6" WATERLINE TO BE ABANDONED

EXISTING FIRE HYDRANT TO BE REMOVED

EXISTING FIRE HYDRANT TO BE REMOVED

STA. 28+87
1– 8" 22.5° BEND

STA. 28+94
1– 8" GATE VALVE & BOX

STA. 29+04
1– 8" X 6" TEE
1– 6" GATE VALVE & BOX
1– FIRE HYDRANT ASSEMBLY

STA. 29+08
1– 8" 22.5° BEND

STA. 29+14
1– 1" AIR RELEASE VALVE

STA. 29+33
1– 8" 45° BEND

STA. 23+98
1– 8" X 6" TEE
1– 6" GATE VALVE & BOX
1– FIRE HYDRANT ASSEMBLY

STA. 23+86
1– 1" AIR RELEASE VALVE
(AIR RELEASE SHALL BE LOCATED OUTSIDE PAVEMENT. INSTALL 1" COPPER FROM WATER MAIN TO RIGHT–OF–WAY AND INSTALL AIR RELEASE AT RIGHT–OF–WAY)

REPLACE EXISTING WATER SERVICE FROM WATER METER TO NEW WATER MAIN. TYPE I SERVICE CONNECTION. POLYETHYLENE (PE) PRESSURE PIPE (MUNCIPEX OR APPROVED EQUAL) WITH TRACER WIRE. TYPICAL UNLESS OTHERWISE NOTED. (SEE DETAIL W–7)

TYPICAL AT ALL DISTURBED AREAS NOT IN PAVEMENT (SEE SEEDING SCHEDULES ON SHEET 12)

STA. 29+33– STA. 33+75
INSTALL PROPOSED 8" WATER MAIN 16' INSIDE BERRY STREET RIGHT–OF–WAY

STA. 29+33 THRU STA. 35+50,
INSTALL SOIL STABILIZATION MATTING (SEE DETAIL ON SHEET 12)

REMOVE EXISTING TREES/SCRUB AS NECESSARY TO INSTALL NEW 8" WATERLINE, TYP.

STERLING STREET

BERRY STREET

OAK VIEW DRIVE

MATCH LINE SHEET 5

MATCH LINE SHEET 7

TBM "D" Rod & Cap Set Elev.= 1550.93

TBM "C" Rod & Cap Set Elev.= 1562.75

Ex. San. MH Top= 1566.91 Inv. in= 1564.81 (2"E) Inv. in= 1564.74 (4"SE) Inv. out= 1564.70 (6"W)

Ex. San. MH Top= 1566.37 Inv. in= 1564.12 (4"NE) Inv. in= 1563.99 (6"E) Inv. out= 1563.96 (8"W)

N/F JAMES L. & ANNE F. HARRIS 423 STERLING ST. PID 8795 000004190

N/F HELEN GERTRUDE ROBERTS 425 STERLING ST. PID 7166 160000513

N/F KAREN A. HANSON 427 STERLING ST. PID 7167 050005275

N/F THOMAS F. SENSABAUGH, ETAL. 429 STERLING ST. PID 10253 010000514

N/F LINDA S. BOCOCK 428 STERLING ST. PID 6701 DB 431 Pg. 298

N/F TAMI W. HARRIS 430 STERLING ST. PID 6093 000002888

N/F DIANE MARSHALL–ISHAM 432 STERLING ST. PID 9785 DB 364 Pg. 361

N/F ESTHER BRENT COFFMAN 434 STERLING ST. PID 9412

N/F ALLEN NOLAN, JR. 436 STERLING ST. PID 9767 110000814

N/F ESTHER BRENT COFFMAN 414 STERLING ST. #G PID 10258 DB 498 Pg. 199

S & H ASSOCIATES OF STAUNTON, LLC 0 OAK VIEW DRIVE PID 101222 (COMMON AREA)

S & H ASSOCIATES OF STAUNTON, LLC 23 OAK VIEW DRIVE PID 101246

S & H ASSOCIATES OF STAUNTON, LLC 21 OAK VIEW DRIVE PID 101247

S & H ASSOCIATES OF STAUNTON, LLC 0 OAK VIEW DRIVE PID 101221 (COMMON AREA)

S & H ASSOCIATES OF STAUNTON, LLC 210 FRONTIER DRIVE PID 101252

Limits of Topographic Survey (Typ.)

Future Lot Line (Approx.)

LOT 47

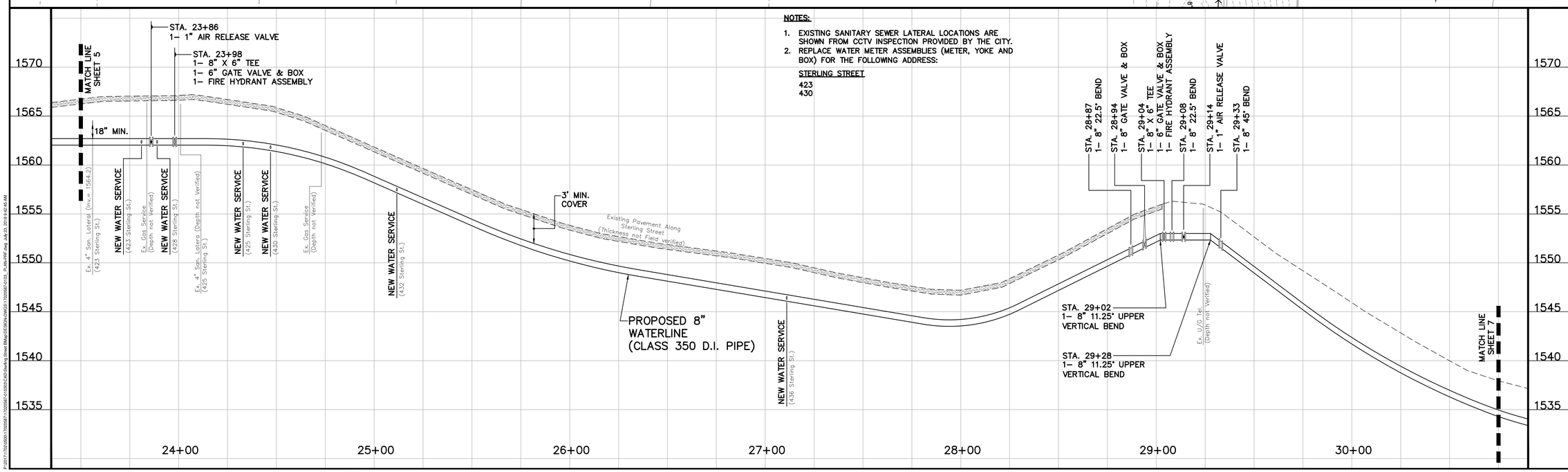
LOT 48

GRAPHIC SCALE
25 0 25 50
(IN FEET)
1 inch = 25ft.

NAD 83

NOTES:
1. EXISTING SANITARY SEWER LATERAL LOCATIONS ARE SHOWN FROM CCTV INSPECTION PROVIDED BY THE CITY.
2. REPLACE WATER METER ASSEMBLIES (METER, YOKE AND BOX) FOR THE FOLLOWING ADDRESS:

STERLING STREET
423
430



COMMONWEALTH OF VIRGINIA
MICHAEL S. HAGGERTY
Lic. No. 35201
7/20/18
PROFESSIONAL ENGINEER

Draper Aden Associates
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PLAN & PROFILE
STERLING STREET WATERLINE
CITY OF STAUNTON, VIRGINIA

REVISIONS
03/08/18 PER CITY COMMENTS
7/10/18 PER CITY COMMENTS

DESIGNED BY: BMC
DRAWN BY: HLJ
CHECKED BY: MSH
SCALE: HORZ: 1"= 25' VERT: 1"=5'
DATE: NOVEMBER 30, 2017
PROJECT NUMBER: 17020587-0103

6
6 OF 12

GRAPHIC SCALE
25 0 25 50
(IN FEET)
1 inch = 25ft.
NAD 83

N/F JEFFREY & NANCY TURK 16 OAK VIEW DR. PID 100846 170000070
N/F FRANKLIN J; JR. & JUDITH C. MARKS 14 OAK VIEW DR. PID 100845 170000529
N/F S & H ASSOCIATES OF STAUNTON, LLC 12 OAK VIEW DR. PID 100844 090002510
N/F EVERETT H; JR. & BETTY L. MARTIN 10 OAK VIEW DR. PID 100843 160002890
N/F CLAY & TERESA B. STERRETT 8 OAK VIEW DR. PID 100842 150001720
N/F S & H ASSOCIATES OF STAUNTON, LLC 6 OAK VIEW DR. PID 100841 090002510
N/F S & H ASSOCIATES OF STAUNTON, LLC 210 FRONTIER DRIVE PID 101252

OAK VIEW DRIVE

LOT 47
LOT 48
LOT 49
LOT 50
LOT 51
LOT 52
LOT 53

Future Lot Line (Approx.)
Limits of Topographic Survey (Typ.)

★TBM "B" Rod & Cap Set Elev.= 1542.94
★TBM "GPS-1" Rod & Cap Set Elev.= 1534.54
★TBM "A" X Marker on MH Top Elev.= 1586.36

Ex. Curb Inlet Top= 1529.10 Inv. in= 1526.04 (NE) Inv. in= 1525.98 (W) Inv. out= 1525.27 (SW)
Ex. Curb Inlet Top=1526.91 Inv. in= 1521.61 (NW) Inv. out= 1521.58 (SW)
Ex. San. MH Top=1526.32 Inv. in= 1519.28 (W) Inv. out= 1519.19 (S)
Ex. San. MH Top=1517.06
Ex. San. MH Top= 1531.57 Inv. in= 1521.57 (NW) Inv. in= 1520.15 W) Inv. out= 1520.05 (SE)
Ex. San. MH Top=1541.18 Inv. in= 1536.08 (N) Inv. out= 1535.93 (SE)
Metal Top Elev.= 1530.90 48" CMP Riser Inv. 1524.68
Ex. Curb Inlet Top=1526.17 Inv. in= 1521.01 (NE) Inv. out= 1520.94 (S)
Ex. San. MH Top=1527.79 Inv. in= 1519.73 (NW) Inv. out= 1519.59 (SE)
Ex. Storm MH Top=1520.07 Inv. in= 1515.90 (E) Inv. in= 1515.24 (N) Inv. out= 1515.14 (SW)
Ex. San. MH Top=1526.66 Inv. in= 1520.97 (N) Inv. out= 1520.82 (E)
Ex. Drop Inlet Top= 1514.80 Inv. out= 1511.73 (SE)
Ex. Curb Inlet Top=1515.46 Inv. in= 1510.29 (NW) Inv. in= 1510.14 (NE) Inv. out= 1510.01 (SE)

STA. 38+09
END PROJECT:
1– 8" X 8" TAPPING SLEEVE AND VALVE

REPLACE SIDEWALK AND CURB & GUTTER TO NEAREST JOINT

Exist. Variable Width Storm Sewer Ease. (From "Red Oaks, Section 3, Final Plat," by Balzer & Associates, 09/30/2014

STA. 36+00 THRU STA. 37+60,
INSTALL SOIL STABILIZATION MATTING (SEE DETAIL ON SHEET 12)

Exist. Variable Width Sanitary Sewer Ease. (From "Red Oaks, Section 3, Final Plat," by Balzer & Associates, 09/30/2014

STA. 37+34
1– 8" 22.5° BEND

NEW 20' PERMANENT UTILITY EASEMENT

STA. 36+46
1– 8" 22.5° BEND

STA. 35+52 THRU STA. 35+70,
REMOVE AND REPLACE RIPRAP

STA. 35+50
1– BLOW–OFF ASSEMBLY

STA. 35+23
1– 8" 45° BEND
1– 8" 22.5° BEND

REMOVE EXISTING TREES/SCRUB AS NECESSARY TO INSTALL NEW 8" WATERLINE, TYP.

PROPOSED 8" WATERLINE (CLASS 350 D.I. PIPE)

TYPICAL AT ALL DISTURBED AREAS NOT IN PAVEMENT (SEE SEEDING SCHEDULES ON SHEET 12)

REMOVE EXISTING TREES/SCRUB AS NECESSARY TO INSTALL NEW 8" WATERLINE, TYP.

STA. 29+33– STA. 33+75
INSTALL PROPOSED 8" WATERLINE 16' INSIDE BERRY STREET RIGHT–OF–WAY

STA. 29+33 THRU STA. 35+50,
INSTALL SOIL STABILIZATION MATTING (SEE DETAIL ON SHEET 12)

BERRY STREET

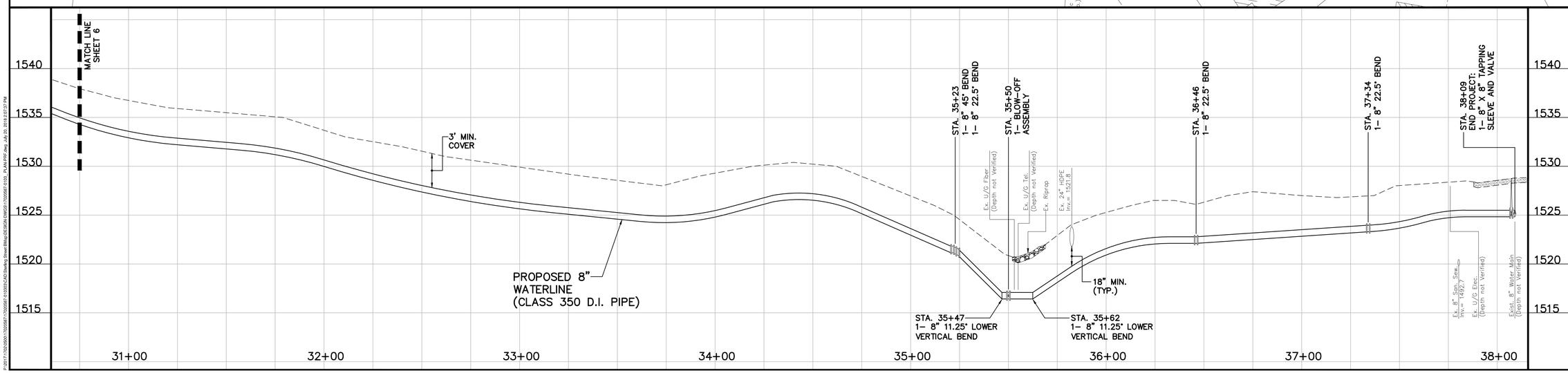
MATCH LINE SHEET 6

IP
SF
TS
PS
B/M

N/F RICHARD L. & JOAN STRAUB, TR. 135 RED OAK DR. PID 11754 060002294
N/F COSTELLO P. YURKOVICH 137 RED OAK DR. PID 11753 060001802
N/F BETTY P. CASIDAY 201 RED OAK DR. PID 11752 WF1400100
N/F KAREN E. SHEEHAN 200 RED OAK DR. PID 11743 WF1500030
N/F LORRAINE G. HARLOW, TRUSTEE 203 RED OAK DR. PID 11751 070001297
N/F EDWARD A. & SUZANNE PERSINA 202 RED OAK DR. PID 11744 170000310
N/F TIMOTHY HOWARD & BEVERLY WELLS 205 RED OAK DR. PID 11750 070001424
N/F KITTY LLC 204 RED OAK DR. PID 11745 170000091
N/F J. DELTON & DONNA RAE BPTKIN LIVING TRUST 206 RED OAK DR. PID 11746 150000833
N/F SALLIE C. FEAGANES 208 RED OAK DR. PID 11747 140001328

RED OAK DRIVE

Existing Fence
8" Cherry
10" Apple



COMMONWEALTH OF VIRGINIA
MICHAEL S. HAGGERTY
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PLAN & PROFILE
STERLING STREET WATERLINE
CITY OF STAUNTON, VIRGINIA

REVISIONS
03/08/18
PER CITY COMMENTS

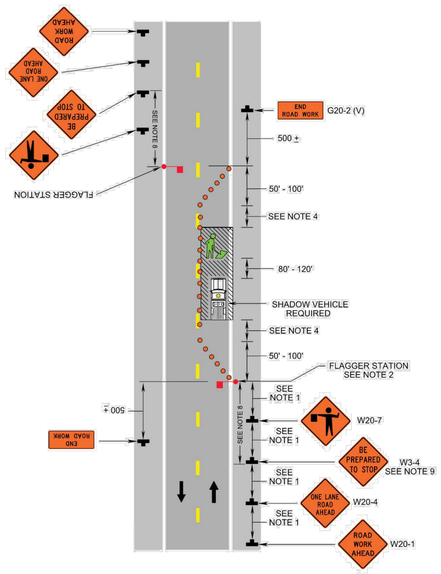
DESIGNED BY: BMC
DRAWN BY: HLJ
CHECKED BY: MSH
SCALE: HORZ: 1"= 25' VERT: 1"=5'
DATE: NOVEMBER 30, 2017
PROJECT NUMBER: 17020587-0103

7
7 OF 12

Overall Sh. 8 of 14

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Lane Closure on a Two-Lane Roadway Using Flaggers
(Figure TTC-23.0)



Typical Traffic Control
Lane Closure on a Two-Lane Roadway Using Flaggers
(Figure TTC-23.0)
NOTES

Guidance:

1. *Sign spacing distance should be 350'-500' where the posted speed limit is 45 mph or less, and 500'-800' where the posted speed limit is greater than 45 mph.*
2. *Care should be exercised when establishing the limits of the work zone to insure maximum possible sight distance in advance of the flagger station and transition, based on the posted speed limit and at least equal to or greater than the values in Table 6H-3. Generally speaking, motorists should have a clear line of sight from the graphic flagger symbol sign to the flagger.*

Option:

3. Where Right-of-Way or geometric conditions prevent the use of 48" x 48" signs, 36" x 36" signs may be used.

Standard:

4. **Flagging stations shall be located far enough in advance of the work space to permit approaching traffic to reduce speed and/or stop before passing the work space and allow sufficient distance for departing traffic in the left lane to return to the right lane before reaching opposing traffic (see Table 6H-3 on Page 6H-5).**
5. **All flaggers shall be state certified and have their certification card in their possession when performing flagging duties (see Section 6E.01, Qualifications for Flaggers).**
6. **Cone spacing shall be at the following:**

Location	Posted Speed Limit (mph)	
	0 – 35	36 +
Transition Spacing	20'	40'
Travelway Spacing	40'	80'

7. **A shadow vehicle with at least one high intensity amber rotating, oscillating, or strobe light shall be parked 80'-120' in advance of the first work crew.**

Option:

8. A supplemental flagger may be required in this area to give advance warning of the operation ahead by slowing approaching traffic prior to reaching the flagger station or queued traffic.

Guidance:

9. *If the queue of traffic reaches the BE PREPARED TO STOP (W3-4) sign, then the signs should be readjusted at greater distances.*
10. *When a highway-rail crossing exists within or upstream of the transition area and it is anticipated that queues resulting from the lane closure might extend through the highway-rail grade crossing, the temporary traffic control zone should be extended so that the transition area precedes the highway-rail crossing (see Figure TTC-56 for additional information on highway-rail crossings).*

Standard:

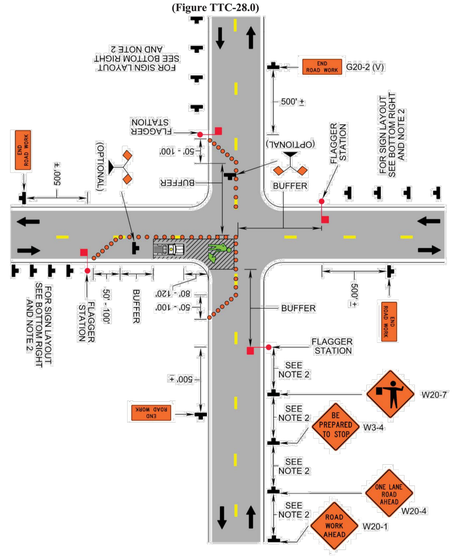
11. **At night, flagger stations shall be illuminated, except in emergencies (see Section 6E.08).**

Option:

12. Cones may be eliminated when using a pilot vehicle operation or when the total roadway width is 20 feet or less.
13. For low-volume situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger, positioned to be visible to road users approaching from both directions, may be used (see Chapter 6E).

WORKZONE A

Lane Closure Operation in an Intersection
(Figure TTC-28.0)



Typical Traffic Control
Lane Closure Operation in an Intersection
(Figure TTC-28.0)
NOTES

Guidance:

1. *The control of traffic through the intersection in order of preference should be:*
   a. *Obtain the services of law enforcement personnel.*
   b. *Detour the effective routes to other roads and streets as approved and directed by the Regional Traffic Engineer.*
   c. *Place a state certified flagger on each leg of the intersection controlling a single lane of traffic.*

   Appropriate signing as shown should be used for law enforcement and flagging operations. For detour signs see Figure TTC-34.
2. *Sign spacing distance should be 350'-500' where the posted speed limit is 45 mph or less, 500'-800' where the posted speed limit is greater than 45 mph.*

Standard:

3. **Channelizing device spacing shall be on 20' centers or less.**

Guidance:

4. *If room permits, a shadow vehicle with at least one rotating amber light or high intensity amber strobe light should be parked 80'-120' in advance of the first work crew.*

Standard:

5. **If the posted speed limit is 45 mph or greater, the shadow vehicle shall have a truck-mounted attenuator.**
6. **For emergency situations (any non-planned operation) of 30 minutes or less duration, two rotating amber lights or high intensity amber strobe lights mounted on the vehicle and visible for 360° shall be required in addition to the channelizing devices shown around the vehicle. Also, vehicle hazard warning signals or amber oscillating lights shall be used.**

Guidance:

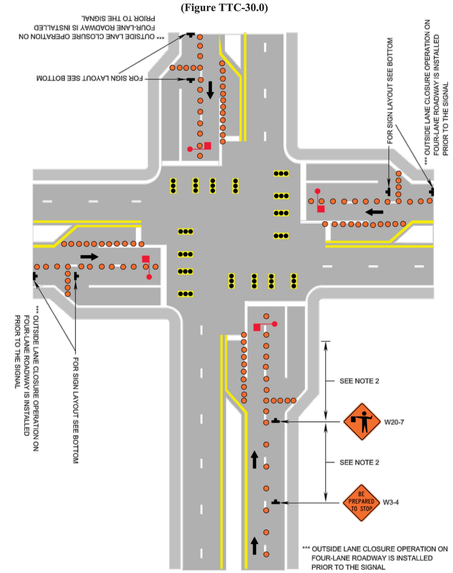
7. *If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure TTC-36.*

Support:

8. Turns can be prohibited as required by vehicular traffic conditions. Unless the streets are wide, it might be physically impossible to make certain turns, especially for large vehicles.

WORKZONE B

Flagging Operation at a Signalized Intersection
(Figure TTC-30.0)



Typical Traffic Control
Flagging Operation at a Signalized Intersection
(Figure TTC-30.0)
NOTES

Guidance:

1. *The control of traffic through the intersection in order of preference should be:*
   a. *Obtain the services of law enforcement personnel.*
   b. *Divert the effective routes to other roads and streets as approved and directed by the Regional Traffic Engineer.*
   c. *Place a state certified flagger on each leg of the intersection with the approved signing as shown.*
2. *Sign spacing distance should be 350'-500' where the posted speed limit is 45 mph or less, 500'-800' where the posted speed limit is greater than 45 mph. For urban streets sign spacing distance should be 225'-275' where the posted speed limit is 30 to 35 mph, and 100' -200' where the posted speed is 25 mph or less .*

Standard:

3. **A stationary lane closure shall be installed in advance of the signalized intersection for all approaches with two or more lanes for through traffic.**
4. **All turn lanes at the intersection shall be closed.**
5. **Electrical power supply to signals shall be turned off while flaggers are controlling traffic through the intersection.**
6. **To prevent accidental intrusion into the flagger station, cone spacing shall not exceed 10' on centers from the graphic flagger sign to the flagger station. Cones shall be installed in the closed lane, perpendicular to traffic, prior to the flagging station.**
7. **A lead flagger shall be assigned to control all flagger operations. One flagger shall be stationed to control each approach of the intersection. Flaggers shall alternate right-of-way to traffic such that traffic moves through the intersection one approach at a time.**
8. **Flagger stations shall be illuminated during planned night time work operations with a minimum of horizontal luminance of 5-foot candles (50 lux) (see Section 6E.08).**
9. **On divided highways having a median wider than 8', right and left sign assemblies shall be required.**

Option:

10. RIGHT TURN LANE CLOSED AHEAD (W20-V13R) and/or LEFT TURN LANE CLOSED AHEAD (W20-V13L) sign(s) may be used when closing the turn lanes.
11. For a high volume of turning movements, additional traffic control devices, such as signs (graphic NO LEFT TURN (R3-2), NO RIGHT TURN (R3-1), RIGHT TURN LANE CLOSED AHEAD (W20-V13R) and/or LEFT TURN LANE CLOSED AHEAD (W20-V13L)), cones and vehicles may be used.

WORKZONE C

COMMONWEALTH OF VIRGINIA
MICHAEL S. HAGGERTY
Lic. No. 35201
7/20/18
PROFESSIONAL ENGINEER

Draper Aden Associates
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TRAFFIC CONTROL-TYPICAL WORKZONES
STERLING STREET WATERLINE
CITY OF STAUNTON, VIRGINIA

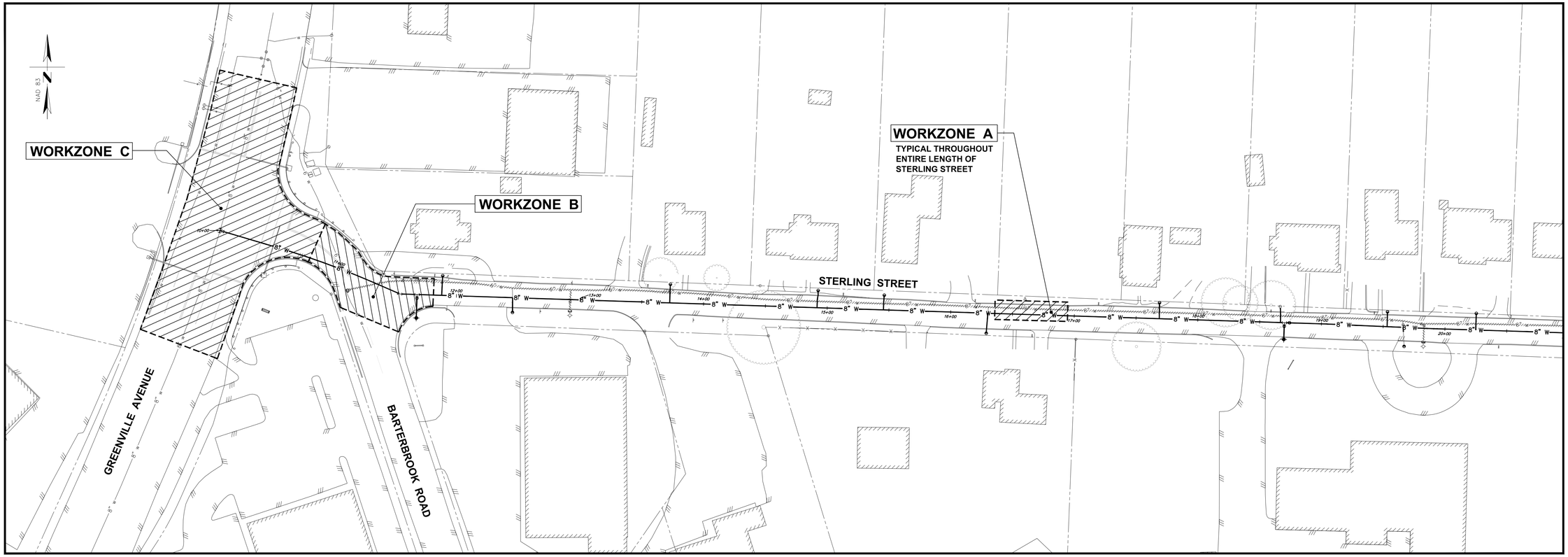
REVISIONS
03/08/18
PER CITY COMMENTS

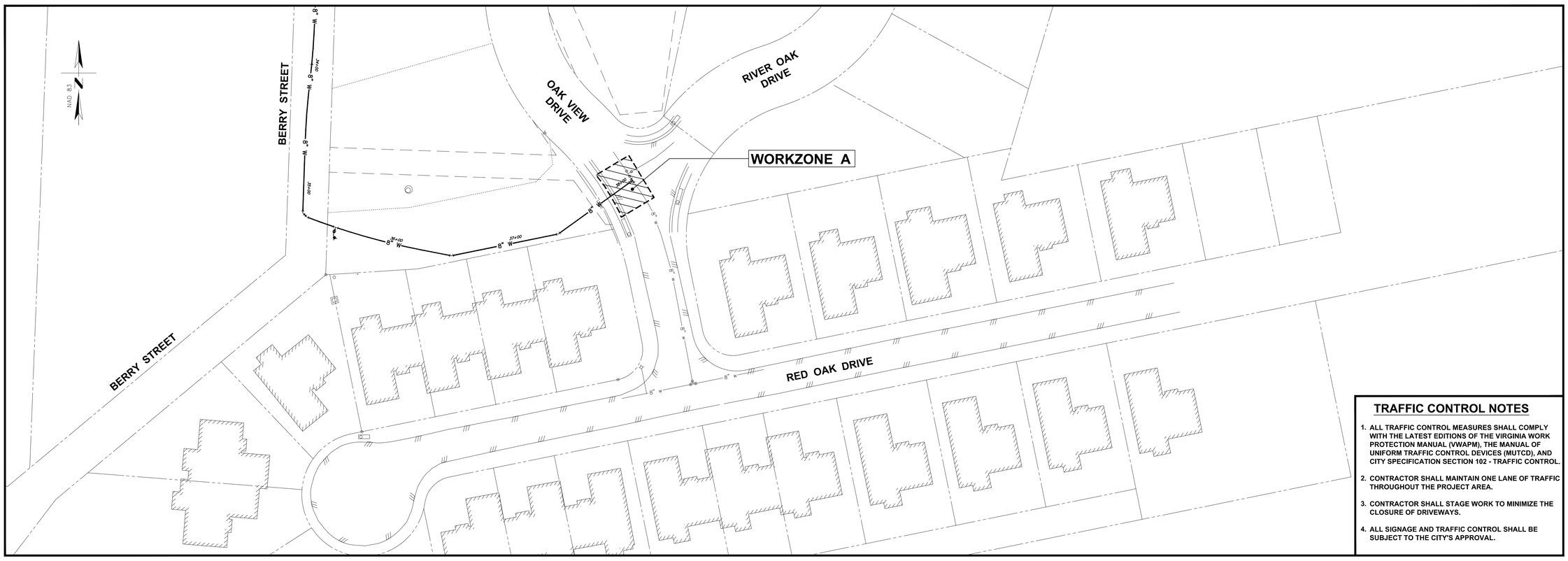
DESIGNED BY: BMC
DRAWN BY: HLJ
CHECKED BY: MSH
SCALE: NOT TO SCALE
DATE: NOVEMBER 30, 2017
PROJECT NUMBER: 17020587-0103

8
8 OF 12

Overall Sh. 9 of 14

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TRAFFIC CONTROL NOTES

1. ALL TRAFFIC CONTROL MEASURES SHALL COMPLY WITH THE LATEST EDITIONS OF THE VIRGINIA WORK PROTECTION MANUAL (VWAPM), THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), AND CITY SPECIFICATION SECTION 102 - TRAFFIC CONTROL.
2. CONTRACTOR SHALL MAINTAIN ONE LANE OF TRAFFIC THROUGHOUT THE PROJECT AREA.
3. CONTRACTOR SHALL STAGE WORK TO MINIMIZE THE CLOSURE OF DRIVEWAYS.
4. ALL SIGNAGE AND TRAFFIC CONTROL SHALL BE SUBJECT TO THE CITY'S APPROVAL.

COMMONWEALTH OF VIRGINIA
PROFESSIONAL ENGINEER
7/20/18

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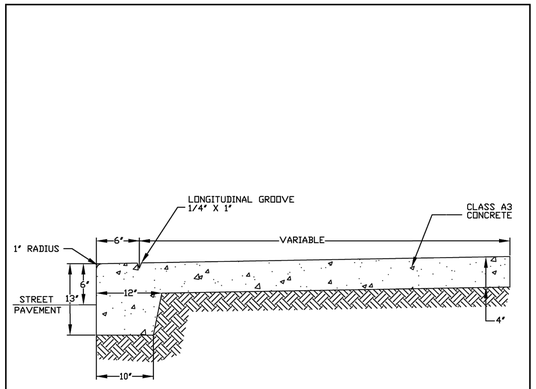
TRAFFIC CONTROL PLAN
STERLING STREET WATERLINE
CITY OF STAUNTON, VIRGINIA

REVISIONS
03/08/18
PER CITY COMMENTS

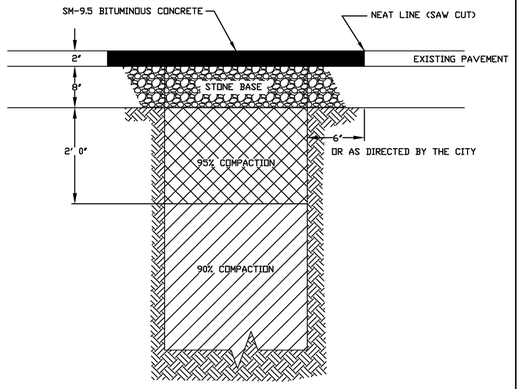
DESIGNED BY: BMC
DRAWN BY: HLJ
CHECKED BY: MSH
SCALE: 1"= 40'±
DATE: NOVEMBER 30, 2017
PROJECT NUMBER: 17020587-0103

9
9 OF 12

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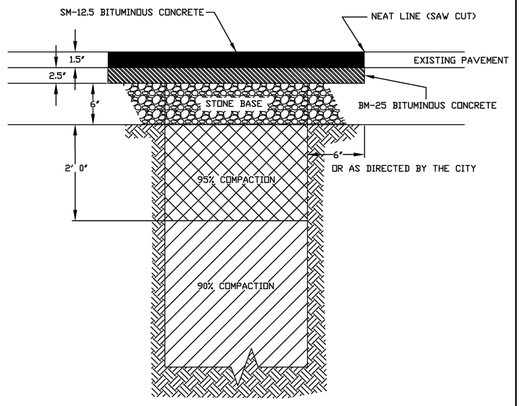
CITY OF STAUNTON, VA	**MONOLITHIC CONCRETE WALK**	Draw No. **M-1**



NOTE:
1. COMPLETED PATCH TO BE FLUSH WITH EXISTING PAVEMENT

STANDARD PATCH TO BE USED FOR BARTERBROOK ROAD, STERLING STREET AND OAK VIEW DRIVE

CITY OF STAUNTON, VA	**STANDARD PATCH FOR ASPHALT PAVEMENT**	Draw No. **M-5**



NOTE:
1. COMPLETED PATCH TO BE FLUSH WITH EXISTING PAVEMENT

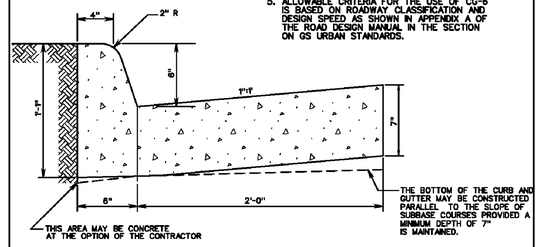
HEAVY DUTY PATCH TO BE USED FOR GREENVILLE AVENUE

CITY OF STAUNTON, VA	**HEAVY DUTY PATCH FOR ASPHALT PAVEMENT**	Draw No. **M-5(H)**

CG-6

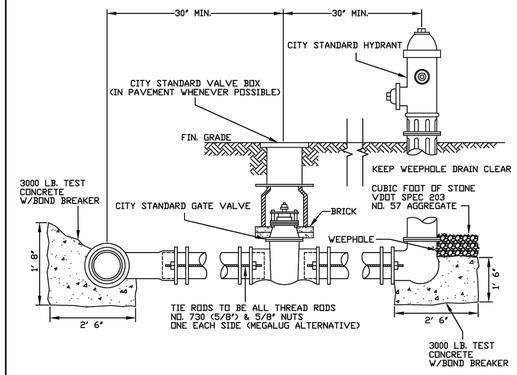
NOTES:

1. THIS ITEM MAY BE PRECAST OR CAST IN PLACE.
2. CONCRETE TO BE CLASS A3 IF CAST IN PLACE, 4000 PSI IF PRECAST.
3. COMBINATION CURB & GUTTER HAVING A RADIUS OF 300 FEET OR LESS (ALONG FACE OF CURB) SHALL BE PAD FOR AS RADIAL COMBINATION CURB & GUTTER.
4. FOR USE WITH STABILIZED OPEN-GRADED DRAINAGE LAYER, THE BOTTOM OF THE CURB & GUTTER SHALL BE CONSTRUCTED PARALLEL TO THE SLOPE OF SUBBASE COURSES AND TO THE DEPTH OF THE PAVEMENT.
5. ALLOWABLE CRITERIA FOR THE USE OF CG-6 IS BASED ON ROADWAY CLASSIFICATION AND DESIGN SPEED AS SHOWN IN APPENDIX A OF THE ROAD DESIGN MANUAL IN THE SECTION ON GS URBAN STANDARDS.



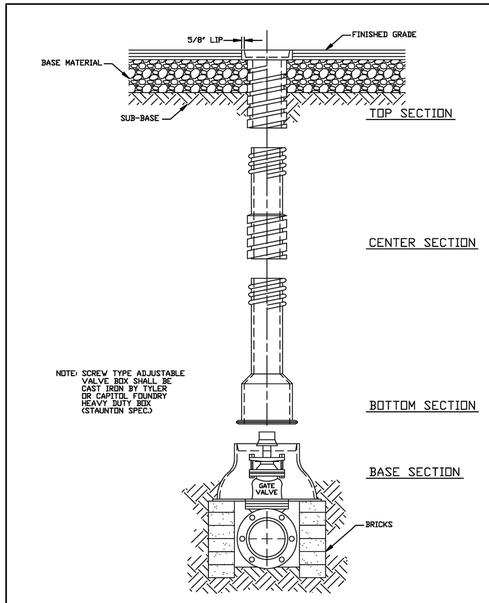
SPECIFICATION REFERENCE
105
502

COMBINATION 6" CURB AND GUTTER VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS REVISION DATE / SHEET 1 OF 1 201.03

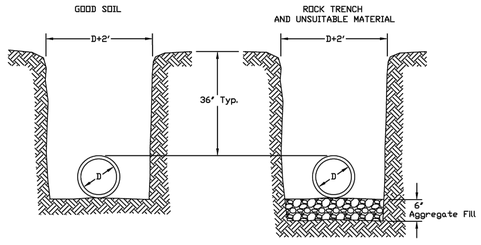


NOTES:
LOCATE VALVE IN PAVEMENT WHERE APPLICABLE
WEEP HOLES SHALL BE LOCATED ABOVE THE SEASONAL WATER TABLE

CITY OF STAUNTON, VA	**STANDARD FIRE HYDRANT ASSEMBLY**	Draw No. **W-10**

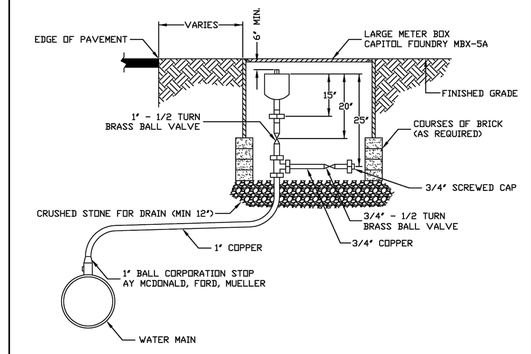


CITY OF STAUNTON, VA	**SCREW - TYPE ADJUSTABLE VALVE BOX**	Draw No. **W-11**



NOTE:
1. ALL BEDDING SHALL BE CONTINUOUS AND UNIFORM
2. EXCAVATION IS REQUIRED TO ENSURE THERE IS NO ROCK WITHIN 6" OF THE BOTTOM OF THE PIPE

CITY OF STAUNTON, VA	**WATER PIPE INSTALLATION**	Draw No. **W-12**



NOTES:
1. ALL COPPER CONNECTIONS AND FITTINGS SHALL BE COMPRESSION
2. AIR RELIEF VALVE TO BE VALMATIC 201C.2

CITY OF STAUNTON, VA	**1" AIR RELIEF VALVE INSTALLATION**	Draw No. **W-18A**

COMMONWEALTH OF VIRGINIA
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DETAILS
STERLING STREET WATERLINE
CITY OF STAUNTON, VIRGINIA

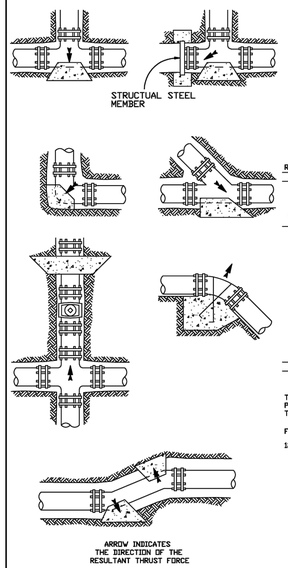
REVISIONS
03/08/18
PER CITY COMMENTS

DESIGNED BY:	BMC
DRAWN BY:	HLJ
CHECKED BY:	MSH
SCALE:	NOT TO SCALE
DATE:	NOVEMBER 30, 2017
PROJECT NUMBER:	17020587-0103

10
10 OF 12

Overall Sh. 11 of 14

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UTILIZE: TO DETERMINE THE THRUST TO BE RESTRAINED BY A THRUST BLOCK

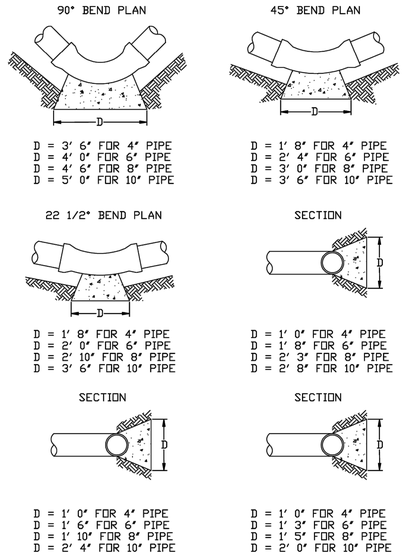
RESULTANT THRUST AT FITTINGS AT 100 PSI WATER PRESSURE
TOTAL POUNDS

NOM. PIPE DIA. IN.	DEAD END	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND
4	1,810	2,559	1,385	706	355
6	3,739	5,288	2,862	1,459	733
8	6,433	9,097	4,923	2,510	1,261
10	9,677	13,685	7,406	3,776	1,897
12	13,685	19,353	10,474	5,340	2,683
14	18,385	26,001	14,072	7,174	3,604
16	23,779	33,628	18,199	9,278	4,661
18	29,865	42,235	22,858	11,653	5,855
20	36,644	51,822	28,046	14,298	7,183
24	52,279	73,934	40,013	20,398	10,249
30	80,425	113,738	61,554	31,380	15,766
36	115,209	162,931	88,177	44,952	22,585
42	155,528	219,950	119,036	60,684	30,489
48	202,683	286,637	155,157	79,083	39,733
54	256,072	362,140	195,989	99,914	50,199

TO DETERMINE THRUST AT PRESSURES OTHER THAN 100 PSI, MULTIPLY THE THRUST OBTAINED IN THE TABLE BY THE RATIO OF THE PRESSURE TO 100

FOR EXAMPLE, THE THRUST ON A 12 INCH, 90° BEND AT 125 PSI IS 19,353 X $\frac{125}{100}$ = 24,191 POUNDS

CITY OF STAUNTON, VA	THRUST BLOCK TABLES XXV,XXIV	Draw No. W-13



D = 3' 6" FOR 4" PIPE
D = 4' 0" FOR 6" PIPE
D = 4' 6" FOR 8" PIPE
D = 5' 0" FOR 10" PIPE

D = 1' 8" FOR 4" PIPE
D = 2' 4" FOR 6" PIPE
D = 3' 0" FOR 8" PIPE
D = 3' 6" FOR 10" PIPE

D = 1' 8" FOR 4" PIPE
D = 2' 0" FOR 6" PIPE
D = 2' 10" FOR 8" PIPE
D = 3' 6" FOR 10" PIPE

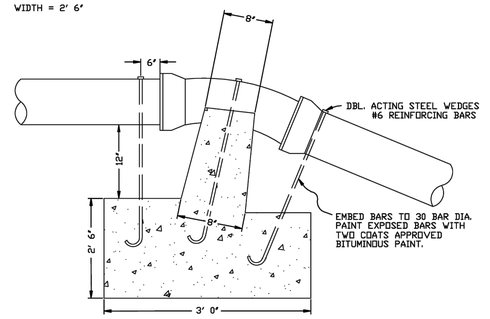
D = 1' 0" FOR 4" PIPE
D = 1' 8" FOR 6" PIPE
D = 2' 3" FOR 8" PIPE
D = 2' 8" FOR 10" PIPE

D = 1' 0" FOR 4" PIPE
D = 1' 6" FOR 6" PIPE
D = 1' 10" FOR 8" PIPE
D = 2' 4" FOR 10" PIPE

D = 1' 0" FOR 4" PIPE
D = 1' 3" FOR 6" PIPE
D = 1' 5" FOR 8" PIPE
D = 2' 0" FOR 10" PIPE

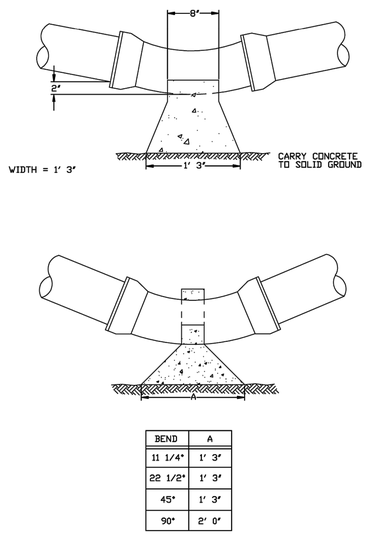
MEGA-LUG ALTERNATIVE FOR BENDS 22 1/2° AND LESS

CITY OF STAUNTON, VA	THRUST BLOCK DETAILS	Draw No. W-14



MEGA-LUG ALTERNATIVE FOR BENDS 22 1/2° OR LESS

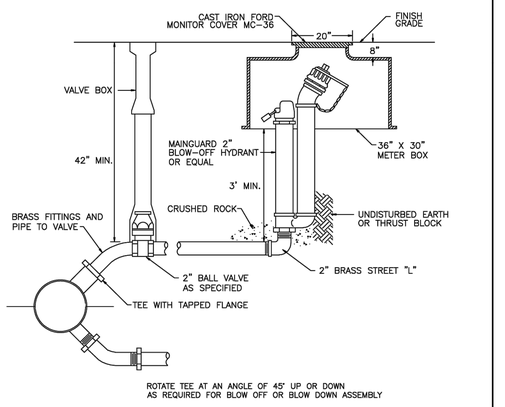
CITY OF STAUNTON, VA	THRUST BLOCK VERTICAL BEND	Draw No. W-15



BEND	A
11 1/4°	1' 3"
22 1/2°	1' 3"
45°	1' 3"
90°	2' 0"

MEGA-LUG ALTERNATIVE FOR BENDS 22 1/2° OR LESS

CITY OF STAUNTON, VA	THRUST BLOCK HORIZONTAL & VERTICAL BENDS	Draw No. W-16

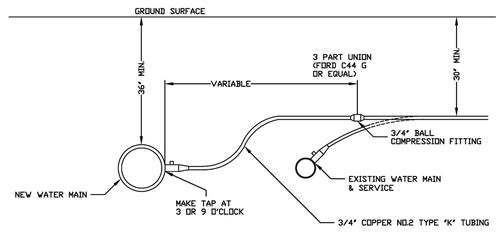


ROTATE TEE AT AN ANGLE OF 45° UP OR DOWN AS REQUIRED FOR BLOW OFF OR BLOW DOWN ASSEMBLY

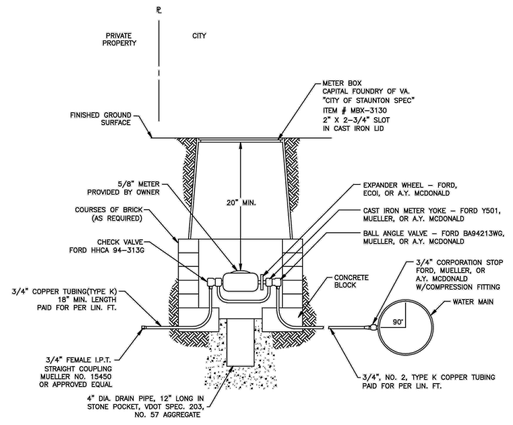
POST HYDRANTS SHALL BE NON-FREEZING, SELF DRAINING TYPE WITH A 3.5 FOOT BURY, SET UNDER GROUND IN A METER BOX. THESE HYDRANTS SHALL BE FURNISHED WITH A 2 INCH FIP INLET, A NON-TURNING OPERATING ROD, AND SHALL OPEN COUNTER-CLOCKWISE. ALL OF THE WORKING PARTS SHALL BE OF BRONZE-TO-BRONZE DESIGN, AND BE SERVICABLE FROM ABOVE GRADE WITH NO DIGGING. THE OUTLET SHALL ALSO BE BRONZE AND BE 2-1/2 INCH NST. HYDRANTS SHALL BE LOCKABLE TO PREVENT UNAUTHORIZED USE. HYDRANTS SHALL BE SIMILAR TO KUPFERLE FOUNDRY CO. MAINGUARD NO. 78 OR APPROVED EQUAL.

DRAIN HOLE SHALL BE PLUGGED IF IT WILL BE BELOW SEASONAL GROUNDWATER LEVELS.

CITY OF STAUNTON, VA	BLOW-OFF VALVE INSTALLATION	Draw No. W-20



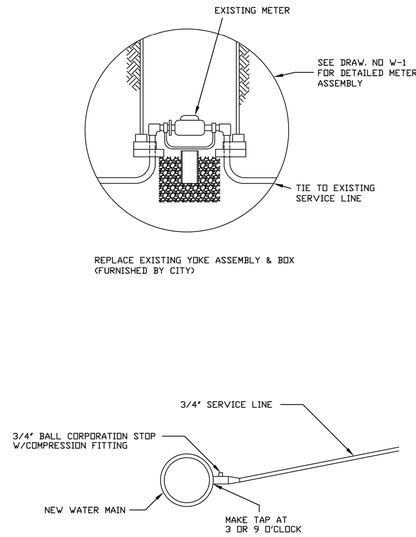
CITY OF STAUNTON, VA	TYPE II SERVICE CONNECTION	Draw No. W-8



ALL COPPER CONNECTIONS AND FITTINGS SHALL BE COMPRESSION

Rev. 7-2-2018

CITY OF STAUNTON, VA	TYPICAL WATER SERVICE CONNECTION UP TO 1"	Draw No. W-1



CITY OF STAUNTON, VA	TYPE I SERVICE CONNECTION	Draw No. W-7

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DETAILS
STERLING STREET WATERLINE
CITY OF STAUNTON, VIRGINIA

REVISIONS
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PER CITY COMMENTS

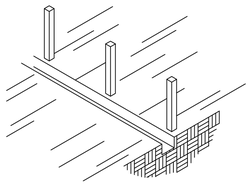
DESIGNED BY: BMC
DRAWN BY: HLJ
CHECKED BY: MSH
SCALE: NOT TO SCALE
DATE: NOVEMBER 30, 2017
PROJECT NUMBER: 17020587-0103

11
11 OF 12

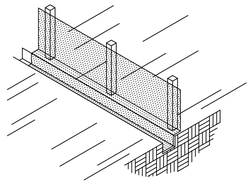
Overall Sh. 12 of 14

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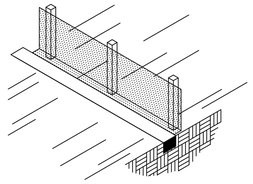
1. SET POSTS AND EXCAVATE A 4"x 4" TRENCH UPSLOPE ALONG THE LINE OF POSTS. SET POSTS A MAXIMUM OF SIX FEET ON CENTERS.



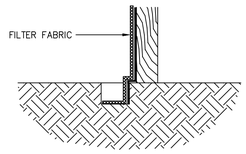
2. ATTACH THE FILTER FABRIC TO THE POSTS AND EXTEND IT INTO THE TRENCH.



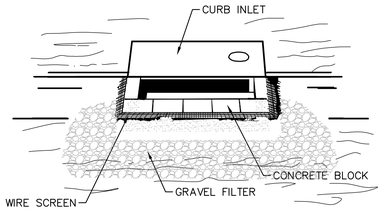
3. BACKFILL AND COMPACT THE EXCAVATED SOIL.

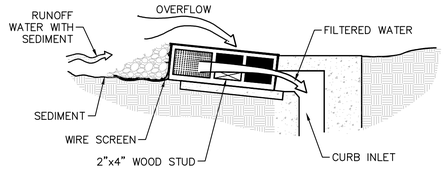


EXTENSION OF FABRIC AND WIRE FENCING INTO THE TRENCH.



SF SILT FENCE
NOT TO SCALE



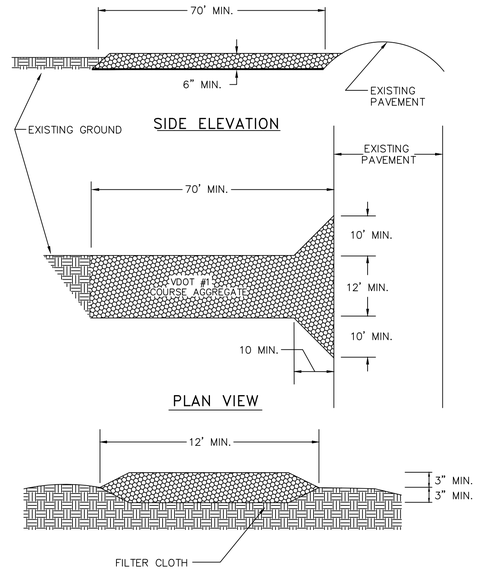


SPECIAL APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE AN OVERFLOW CAPABILITY IS NECESSARY TO PREVENT EXCESSIVE PONDING IN FRONT OF THE STRUCTURE.

* GRAVEL SHALL BE VDOT #3, #357 OR #5 COARSE AGGREGATE

IP INLET PROTECTION
NOT TO SCALE



NOTE:
NUMBER AND LOCATIONS OF CONSTRUCTION ENTRANCES TO BE DETERMINED BY THE CONTRACTOR IN THE FIELD.

CE CONSTRUCTION ENTRANCE
NOT TO SCALE

ACCEPTABLE TEMPORARY SEEDING PLANT MATERIALS

PLANTING DATES	SPECIES	RATE (LBS/ACRE)
SEPT 1–FEB 15	50/50 MIX OF ANNUAL RYEGRASS (LOLIUM MULTI–FLORUM) & CEREAL (WINTER) RYE (SECALE CEREALE)	50–100
FEB 16–APR 30	ANNUAL RYEGRASS (LOLIUM MULTI–FLORUM)	60–100
MAY 1–AUG 31	GERMAN MILLET (SETARIA ITALICA)	50

SEEDINGS MADE IN FALL FOR WINTER COVER AND DURING HOT AND DRY SUMMER MONTHS SHALL BE MULCHED IMMEDIATELY UPON COMPLETION OF SEED APPLICATION WITH TACKIFIED STRAW, IN ACCORDANCE WITH VA E&S STD 3.35.

TS TEMPORARY SEEDING SCHEDULE

GENERAL SLOPE (3:1 OR LESS)	TOTAL LBS PER ACRE
KENTUCKY 31 FESCUE	128 LBS.
RED TOP GRASS	2 LBS.
SEASONAL NURSE CROP	20 LBS.
	150 LBS.

SEASONAL NURSE CROP	
MARCH, APRIL THROUGH MAY 15	ANNUAL RYE
MAY 16 THROUGH AUGUST 15	FOXTAIL MILLET
AUGUST 16 THROUGH SEPTEMBER, OCTOBER	ANNUAL RYE
NOVEMBER THROUGH FEBRUARY	WINTER RYE

LIME AND FERTILIZER NEEDS SHALL BE DETERMINED BY SOIL TESTS.

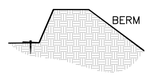
SEEDINGS TO BE MULCHED AT THE RATE OF 2 TONS PER ACRE WITH TACKIFIED STRAW, IMMEDIATELY UPON COMPLETION OF SEED APPLICATION, IN ACCORDANCE W/ VA E&S STD 3.35.

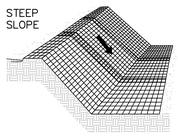
PS PERMANENT SEEDING SCHEDULE



ON SHALLOW SLOPES, STRIPS OF NETTING PROTECTIVE COVERINGS MAY BE APPLIED ACROSS THE SLOPE.

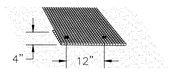
WHERE THERE IS A BERM AT THE TOP OF THE SLOPE, BRING THE MATERIAL OVER THE BERM AND ANCHOR IT BEHIND THE BERM.

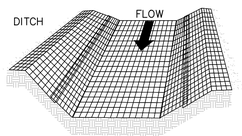




ON STEEP SLOPES, APPLY PROTECTIVE COVERING PARALLEL TO THE DIRECTION OF FLOW AND ANCHOR SECURELY.

BRING MATERIAL DOWN TO A LEVEL AREA BEFORE TERMINATING THE INSTALLATION. TURN THE END UNDER 4" AND STAPLE AT 12" INTERVALS.





IN DITCHES, APPLY PROTECTIVE COVERING PARALLEL TO THE DIRECTION OF FLOW. USE CHECK SLOTS AS REQUIRED. AVOID JOINING MATERIAL IN THE CENTER OF THE DITCH IF AT ALL POSSIBLE.

B/M SOIL STABILIZATION MAT

COMMONWEALTH OF VIRGINIA
MICHAEL S. HAGGERTY
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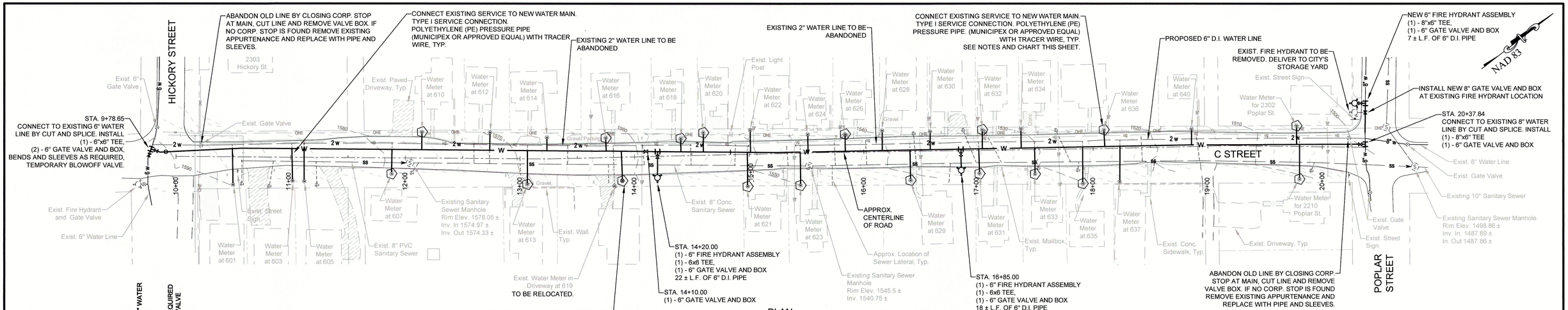
EROSION & SEDIMENT CONTROL DETAILS
STERLING STREET WATERLINE
CITY OF STAUNTON, VIRGINIA

REVISIONS
03/08/18
PER CITY COMMENTS

DESIGNED BY:	BMC
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12
12 OF 14

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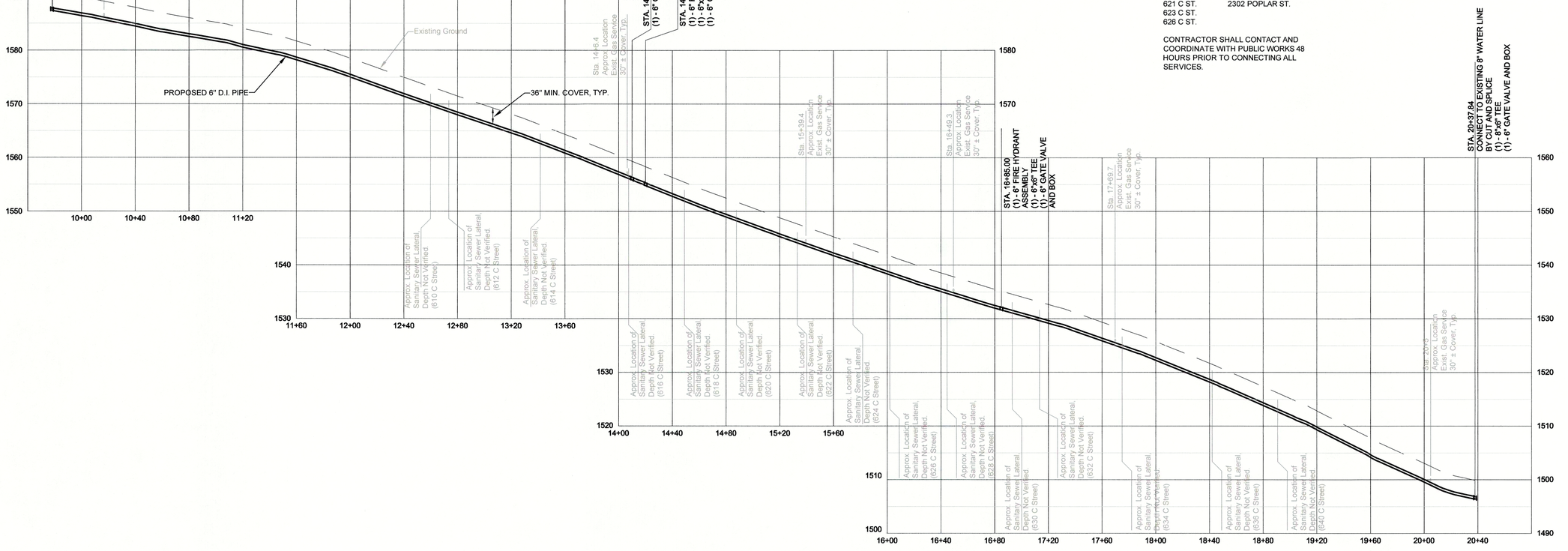


CAUTION:
COULD NOT FIELD LOCATE ALL EXISTING GAS SERVICES.

DENOTES LOCATIONS WHERE WATER METER ASSEMBLIES ARE PROPOSED TO BE REPLACED. OTHER METERS, YOKES AND BOXES TO REMAIN UNLESS ENGINEERING DIRECTS OTHERWISE AT TIME OF CONSTRUCTION.

607 C ST.
610 C ST.
613 C ST.
616 C ST.
618 C ST.
619 C ST.
620 C ST.
621 C ST.
623 C ST.
626 C ST.
629 C ST.
631 C ST.
632 C ST.
633 C ST.
635 C ST.
636 C ST.
2210 POPLAR ST.
2302 POPLAR ST.

CONTRACTOR SHALL CONTACT AND COORDINATE WITH PUBLIC WORKS 48 HOURS PRIOR TO CONNECTING ALL SERVICES.



COMMONWEALTH OF VIRGINIA
NICKIE D. MILLS
Lic. No. 031205
PROFESSIONAL ENGINEER
8-23-18

CITY OF STAUNTON

Engineering Department
116 W. Beverley St., P.O. Box 58, Staunton, VA 24402
540-332-3858

FY 19 WATER LINE IMPROVEMENTS

C STREET PLAN and PROFILE

July 2018

SH. 14 OF 14

Overall Sh. 14 of 14